NETWORK WORLD

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AT&T fires new volleys in price war

By Bob Wallace
Senior Editor

WASHINGTON, D.C — AT&T last week asked the Federal Communications Commission for permission to offer special pricing incentives on all switched and dedicated services and to overhaul pricing of its Dataphone Digital Service (DDS).

Responding to increasing competition in the long-distance industry, AT&T said it will give users as much as $50 million per year in special promotions, including waiving or discounting service installation charges, flat monthly fees or usage charges.

In its FCC filing, AT&T also detailed major price reductions as well as new term and volume discounts on its DDS offerings that could save users as much as 27%.

Industry analysts said other long-distance carriers, including MCI Communications Corp. and US Sprint Communications Co., are likely to challenge the AT&T filing. MCI could not be reached for comment. US Sprint said it is studying the filing and has not decided whether to challenge it.

Pending FCC approval, AT&T will begin offering marketing promotions on Jan. 11. The DDS changes are expected to take effect Jan. 21.

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FTS 2000 facts

The winners:
- ★ AT&T-led team (60%)
- ★ US Sprint Communications Co. (40%)

The loser:
- ★ Team led by MCI Communications Corp. and Martin Marietta Corp.

Contract value:
- ★ The government estimates between $3 billion and $10 billion over 10 years. It may be worth up to $25 billion.
- ★ AT&T says its part of the contract is worth up to $15 billion.
- ★ US Sprint says its portion is worth up to $5 billion.

Who serves whom:
- ★ The AT&T team will provide services to nearly 70 federal agencies, including the CIA, the FCC and the departments of Defense, Commerce, Education and Transportation.
- ★ US Sprint will serve about 35 agencies, including the FBI, the GSA and the departments of Justice, Labor and Treasury.

FTS = Federal Telecommunications System
GRAPHIC BY SUSAN J. CHAMPENY

International bank reins in its worldwide network

Manufacturers Hanover rethinks its strategy, downsizes GEONET packet-switching network.

By Wayne Eckerson
Staff Writer

NEW YORK — In 1979, Manufacturers Hanover Corp. began building a private packet-switching network to link diverse networks serving bank sites around the globe.

The international banking conglomerate wanted the backbone net to bridge nearly two dozen networks supporting computers from a variety of vendors. Manufacturers Hanover believed the global network would help control rising network costs and support new services, giving the bank an edge in rapidly expanding international markets as well as in the deregulated domestic banking market.

Today, Manufacturers Hanover is downsizing the network, called GEONET, which at its height in 1987 extended to 32 countries and supported an equal number of switching nodes. The bank has dismantled several switching nodes and shifted the bulk of its metropolitan New York traffic to a sizable T-1 network. The GEONET network currently supports 27 nodes and serves bank locations in 28 countries.

The downsizing came about

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AT&T, US Sprint win coveted fed net deal

Carriers share megabucks FTS 2000 contract; MCI/Martin Marietta team left out in the cold.

By Anita Taff
Senior Correspondent, Washington

WASHINGTON, D.C. — The U.S. General Services Administration last week named AT&T and US Sprint Communications Co. cowinners of the giant Federal Telecommunications System (FTS) 2000 network contract, which could be worth as much as $25 billion over 10 years.

After a two-year bidding process marked by numerous delays and political squabbling, the GSA finally selected the vendors to handle the upgrade of the 25-year-old network currently serving federal agencies. FTS 2000 will be a digital network supporting advanced voice, data and video services.

The MCI Communications Corp./Martin Marietta Corp. team — the third bidder vying for the lucrative contract — was left out in the cold by the government. Northern Telecom, Inc. was also part of the MCI team.

Officials of MCI and Martin Marietta expressed disappointment with the GSA decision and questioned why they were not selected. MCI issued a statement saying it might protest the award in court or before the Federal Communications Commission if any irregularities are found.

The team headed by AT&T, which includes bidding partners Boeing Computer Services Co., Computer Sciences Corp. and a number of smaller subcontractors, won a 60% share of the contract. US Sprint had no bidding partners but will use GTE Government Systems as a subcontractor.

The winning bidders must now meet with the GSA, the agency that oversees the contract, to

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Bellcore
Bell Communications Research

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Top BELLCORE researcher discusses the future of packet switching. Page 13.

Car makers push EDI to new levels

By Barton Crockett
Senior Writer

To gain an edge on international rivals, U.S. automobile manufacturers are driving electronic data interchange (EDI) networks down to the lowest tiers of the automotive industry — the companies that sell to the car maker's suppliers.

Automakers have already implemented EDI links with most of their suppliers. But few of these suppliers have undertaken EDI efforts with the companies from which they buy equipment and raw materials.

Today, however, suppliers are under increasing pressure from large auto manufacturers to extend their use of EDI to the next level of producers.

Automakers want their suppliers to reap management benefits and cost savings by using EDI, and they are expecting those savings to be passed on to them. In addition, the car manufacturers

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NETLINE

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FIVE VENDORS UNVEIL applications that work with HP's OpenView network management system. Page 2.

AT&T WEIGHS EXPANSION of an innovative new sales program. Page 2.

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NEWSPAPER

FEATURE

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Fiber makes inroads into voice and data highways

But analog local loops will be the weak link in the public net chain for many years to come.

By Bob and Rich Reinhold
Special to Network World

MANAGEMENT
UPDATE

Can a pin dropping in Los Angeles really be heard by someone in New York just because there's a clear fiber-optic telephone connection between the two cities? The copper local loop wouldn't have any effect on the transmission, would it? Well, if you believe all that, give us a call. We've got some swampland in Florida we'd like to sell you. And as a bonus, this one time only, we'll cable it with fiber optics.

Fiber optics has been among the most publicized components in the modernization of the nation's telecommunications infrastructure. A reason for this publicity might be that the average person is intrigued by the high-tech, futuristic world of laser technology. Simply put,

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Firms unveil applications to support HP's OpenView

Five vendors announce products that work with OSI-based integrated net management system.

By Jim Brown
New Products Editor

PALO ALTO, Calif. — Hewlett-Packard Co.'s Information Networks Group last week said five vendors have developed applications that work with HP's microcomputer-based OpenView integrated network management system.

The vendors' applications can transmit network management information about their products to OpenView running on a central-site, MS-DOS-based personal computer. Working with the applications, OpenView can also issue commands to control the vendors' equipment.

The five vendors are:

- **Ungermann-Bass, Inc.** of Santa Clara, Calif., which developed an application that enables OpenView to manage its local networks.
- **FiberCom, Inc.** of Roanoke, Va., which built an application enabling OpenView to manage its fiber-optic local networks, including Ethernet and Fiber Distributed Data Interface offerings.
- **Microtronix Systems, Ltd.** of Ontario, which wrote an application enabling OpenView to manage a network of its X.25 switches and packet assembler/disassemblers.
- **Telindus N.V.** of Belgium, which developed an application enabling OpenView to manage the modems, multiplexers and X.25 switches it sells to European carriers and private businesses.
- **Jutland Telephone Co.** of Denmark, which wrote an application that will enable customers to manage public and private-line services from an OpenView workstation.

Roughly 100 other vendors are developing or considering development of OpenView applications, including Northern Telecom, Inc. and 3Com Corp., said Jackye Churchill, HP group marketing manager for OpenView.

As previously announced, Northern Telecom is developing an OpenView application to monitor and control its Meridian private branch exchanges, and 3Com Corp. is developing an application for its local net products, Churchill said.

HP currently has applications enabling OpenView to manage HP 3000 Series minicomputers as well as receive network management data from HP's protocol analyzers and telecommunications line-testing equipment.

The OpenView applications announced last week give Open-

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AT&T weighs wider use of innovative sales program

Network technicians play the part of sales reps.

By Bob Wallace
Senior Editor

WHITE PLAINS, N.Y. — AT&T is considering nationwide expansion of an innovative program that empowers network technicians to sell long-distance services to non-AT&T customers who mistakenly call AT&T for service.

According to AT&T, workers at its service centers often field calls from customers who think they use AT&T services but who are actually served by other long-haul carriers.

Several months ago, an AT&T technician suggested that the company take advantage of the situation and attempt to win over these customers. AT&T undertook a nine-week feasibility test of the sales-lead idea and netted $500,000 in business. The carrier has now formally implemented the so-called win-back program in its Northeast region and is considering expanding it throughout the U.S.

If implemented nationwide, which could happen as early as next month, the program could help AT&T regain at least $7 million annually in long-distance business from rival carriers, according to AT&T Assistant Manager Diane Jarrett.

"[These customers] could be called right when they are experiencing some dissatisfaction with other carriers' services," Jarrett said.

The win-back program is one of many efforts undertaken by AT&T to stem the advances of competitors. These efforts include regulatory initiatives such as Tariffs 12 and 15.

The win-back program had its genesis with T.P. McDermott, a communications technician stationed at AT&T's long-distance repair center here. He noticed that non-AT&T customers were calling his group to log service problem reports.

"McDermott thought this information could be a useful marketing tool, so he called around to [AT&T] sales offices to find someone who'd be interested in following up on his leads," an AT&T spokeswoman said.

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Briefs

Bye, bye Rolm? Industry analysts said that IBM may announce as early as this week the sale of some parts of its Rolm Systems Division. Such a transaction has been expected for months ("Rolm losses may force IBM's hand," *NW*, Nov. 14). Merrill Lynch & Co., Inc. and SoundView Financial Group, Inc., a high-technology securities firm, recently began telling clients that IBM is preparing to announce the sale of Rolm's service and possibly its sales operations, according to published reports. Siemens AG of West Germany is considered the likely purchaser.

Polishing up the Apple. Apple Computer, Inc. appears to be getting closer to delivering a heralded IBM Advanced Program-to-Program Communications link for its Macintosh microcomputers. In an interview with *Network World,* Don Casey, Apple's vice-president of networking and communications, declined to give a specific availability date for the APPC product. However, he indicated that it is not too far off. "It's in worldwide beta test right now," he said. "The users who've got it say they're very pleased and have encountered no problems." APPC support will enable programs running on the Macintosh to communicate with programs running on IBM machines.

At odds. MCI Telecommunications Corp. last week alleged that AT&T has offered custom network deals to 35 users, including Chrysler Corp., Electronic Data Systems Corp., Citicorp, Digital Equipment Corp. and Sears, Roebuck and Co. MCI's claim came in comments filed with the Federal Communications Commission opposing AT&T's Tariff 15. MCI offered no direct evidence regarding the alleged custom networks but questioned why AT&T had not reported them as ordered by the FCC in its investigation of Tariff 15. On Oct. 20, AT&T filed a list of 12 customer-specific deals that were in effect during 1988.

Super switch. Pacific Bell last week cut over what it called the largest digital Centrex switch in the nation, a Northern Telecom, Inc. DMS SuperNode installed at a central office in Sacramento, Calif. The switch will support nearly 44,000 Centrex lines for voice and data communications. Pacific Bell said SuperNode supports slow-scan video, packet switching, graphics and central office-based local networks, and will eventually allow Pacific Bell to provide voice mail, electronic mail and Integrated Services Digital Network services.

No free lunch. AT&T said last week it will now charge vendors for tests conducted to determine whether customer premises equipment is compatible with AT&T's network services. Under the new program, each vendor will be charged a $500 to $15,000 reservation fee when it sets a testing appointment and a $500 to $3,000 fee for each day of product testing. The fee schedule is based upon the network service involved, the complexity of the test and fees charged by other companies for comparable tests, AT&T said. AT&T began offering free testing services to communications equipment vendors in 1983. The policy change will go into effect on Feb. 15, the carrier said.

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Data Communications

Engineers at BELLCORE have demonstrated a prototype of an advanced packet switch that promises to support a new generation of high-bandwidth network services. **Page 13**

Local Networking

CrossComm recently introduced a new version of its ILAN bridge that supports up to eight leased-line links between local networks at speeds ranging from 19.2K bit/sec to the T-1 rate. **Page 17**

Management Strategies

While decentralization is very much in vogue in U.S. industry, a decentralized approach to communications management makes it difficult for a company to adopt standards such as Open Systems Interconnection. **Page 21**

Products & Services

SynOptics Communications last week introduced a system that enables users to manage a network of its LattisNet concentrators, which support 10M bit/sec Ethernets over twisted-pair wire or fiber-optic cable. **Page 23**

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NTI regroups N. American manufacturing operations

Will mean layoffs, transfers for 2,500 workers.

By Bob Brown
Senior Writer

MISSISSAUGA, Ont. — Northern Telecom Ltd. said last week it will take as much as a $200 million charge against fourth-quarter earnings to cover costs of reorganizing its manufacturing operations and laying off or transferring 2,500 employees.

The company said the moves are designed to focus resources on core product markets, including the private branch exchange and central office switch markets. Analysts applauded the cost-cutting efforts, saying they are necessary for Northern Telecom to maintain its slim profit margins in those highly competitive arenas.

Edmund Fitzgerald, Northern Telecom's chairman and chief executive officer, said the company is "streamlining operations and redeploying assets" so it can "reaffirm the focus on those product lines most important to our future," such as PBXs and central office switches.

The restructuring will result in layoffs or transfers for about 5% of the company's worldwide work force of 50,000 employees, about 44,000 of whom are in North America.

Among the Northern Telecom operations affected by the personnel changes are the company's transmission products facility in Aylmer, Que., where the DMS-1U digital subscriber carrier system (a T-1 multiplexer) is made; network support services operations in Concord, N.H., where test equipment is made; several telephone terminal facilities in Nashville; and printed circuit board manufacturing plants in Belleville, Ont., and West Palm Beach, Fla.

The company said it will offer retraining and reassignments to many of the employees affected by the restructuring. Layoffs will be kept to a minimum, the company said.

Northern Telecom said it has already cut some 400 jobs since July, including about 200 middle-management jobs at its Integrated Network Systems Group in Research Triangle Park, N.C., where the company makes telephone switches.

Early in 1989, Northern Telecom will begin to transfer operations from its Aylmer plant to its transmission systems facility in St. Laurent, Que., which is undergoing a $30 million expansion to accommodate the previously announced consolidation of several Northern Telecom facilities in Montreal. Some production responsibilities from the Aylmer facility will also be transferred to the company's Winnipeg, Man.-based division.

Northern Telecom's network support services facility in Concord will be transferred to Raleigh, N.C., beginning in January. This will more closely align the support services operation with

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MCI reduces long-haul rates 3.9%

By Rex Bowman
West Coast Correspondent

WASHINGTON, D.C. — Following the lead of its rivals, MCI Communications Corp. last week announced it is reducing rates on its 1+ long-distance service and other business services, including MCI 800 and its WATS-like Prism offerings.

MCI said it will cut its long-distance rates by 3.9%. The company also plans to reduce the per-minute rates for users of its MCI card by 4.1%. Both rate reductions are scheduled to take effect Jan. 1.

MCI said the cuts will make its long-distance service an average of 21% less expensive than AT&T's. The reductions come one week after similar cuts by US Sprint Communications Co. US Sprint is reducing rates for its 1+ long-distance service an average of 3.75% for business customers. Both MCI and US Sprint said reductions in local access charges allowed them to make the rate cuts.

MCI said its rate reductions would amount to $160 million per year. AT&T said its reductions, which went into effect late last month, will amount to a $697 million yearly rate cut.

MCI announced it would also reduce the rates for many of its business services on Feb. 1. According to MCI:

- The rate for its Prism Plus bulk-calling service will drop 3.5%, and the monthly service fee will drop from $75 to $10 for customers with more than $120 in monthly usage charges. Businesses spending more than $130 per month on Prism Plus will receive a 10% discount, and those spending more than $2,000 per month will receive a 20% discount.
- Rates for Prism I, II and III WATS-like services will fall an average of 3.3%, and businesses that spend more than $10,000 per month on interstate Prism I service will receive a 5% discount.

Prism I is for businesses spending more than $10,000 per month on long-distance calls. Prism II is for businesses that spend between $2,000 and $10,000 per month, and Prism III is for businesses that spend between $500 and $2,000.

Prism I and II require the use of dedicated access lines. Prism III requires the use of WATS access lines.

- The rate for MCI 800 Service will drop 3.6%, while the monthly service fee will fall from $850 to $20.
- Usage rates for Vnet, MCI's virtual private network service, will fall an average of 7.9%, and the maximum volume discount will go up from 6% to 9%.
- Customers of MCI's Corporate Account Service (CAS) Plus option will receive a 5% discount for

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IBM Information Network to test GTE's ISDN service

By Jim Brown
New Products Editor

TAMPA, Fla. — GTE Corp. last week announced that IBM's Information Network division, based here, will test GTE's Integrated Services Digital Network Basic Rate Interface service starting this month.

In the test, IBM will link a mix of data terminal equipment supporting asynchronous, Synchronous Data Link Control and X.25 protocols to its Systems Network Architecture-based Information Network via ISDN. The test is designed to determine the reliability of ISDN connections and how difficult it is to isolate problems in an ISDN link, said Tim Scholl, senior staff engineer with IBM's Information Network division.

In the test, GTE's Tampa-based telephone operating company, GTE Florida, will provide the Information Network with 10 ISDN Basic Rate Interface service lines, each of which provides two 64K bit/sec digital B channels supporting voice or data and one 16K bit/sec D signaling channel.

IBM has the option to expand the test to a total of 32 Basic Rate Interface lines, said Peter Konidaras, director of GTE's ISDN and marketing technology. The test does not involve the ISDN Primary Rate Interface, which uses a T-1 line to support 23 64K bit/sec B channels and one 64K bit/sec D channel.

If the test is successful, IBM will enable customers to use ISDN to access the Information Network, a value-added network that supports a number of services.

Replacement for modems

"We're looking at ISDN to replace the existing dial-up and leased-line modems used to access the Information Network today," Scholl said. Those modems operate at up to 9.6K bit/sec.

To support the IBM test, GTE Florida will provide a 45M bit/sec fiber-optic T-3 link between an AT&T 5ESS digital switch at its Tampa central office and an AT&T SLC-96 digital subscriber loop carrier system on the Information Network premises.

That T-3 link will initially support three T-1 lines, one of which will be used as a backup. The two primary T-1 lines will provide the 20 64K bit/sec B channels and the 10 16K bit/sec D channels needed to support 10 Basic Rate Interface lines.

In the test, IBM will attach user terminals or microcomputers and telephones to a series of ISDN terminal adapters, which are stand-alone units supporting an RS-232 or V.35 interface as well as an RJ-11 jack.

Voice and data calls will be routed via the SLC-96 to the central office, which will pass the calls back to the SLC-96. The calls will then be delivered to the appropriate receiving terminal adapter. This will show IBM whether the central office switch is capable of routing ISDN calls.

Voice calls will be sent to telephones, while data calls will be passed to an IBM cluster controller, protocol converter or front-end processor linked to an Information Network-attached IBM mainframe. The telephones will only be used to support voice calls between technicians trying to determine the cause of an ISDN circuit problem.

May replace fiber

Scholl said IBM will also test ISDN as a potential replacement for an existing leased, fiber-optic link that connects terminals in one IBM building to hosts in another IBM building located 500 to 600 feet away.

Later next year, GTE and IBM will expand their test to enable Information Network users to exchange information with GTE Data Services, Inc. host computers.

GTE Data Services provides data processing service to GTE's telephone companies and other customers. It also develops mainframe-based applications.

The test complements an ongoing test in which GTE Florida terminals are linked via two Basic Rate Interface lines to hosts at a GTE Data Services site here.

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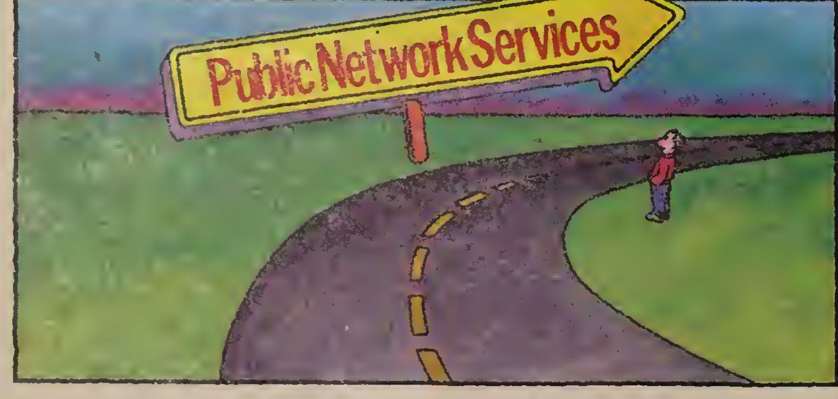

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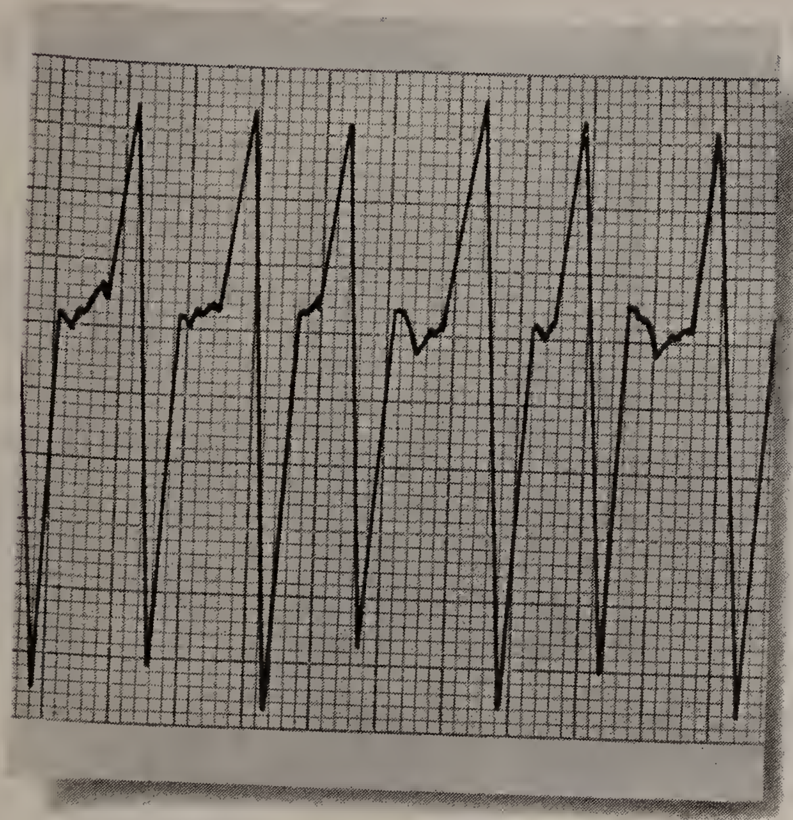

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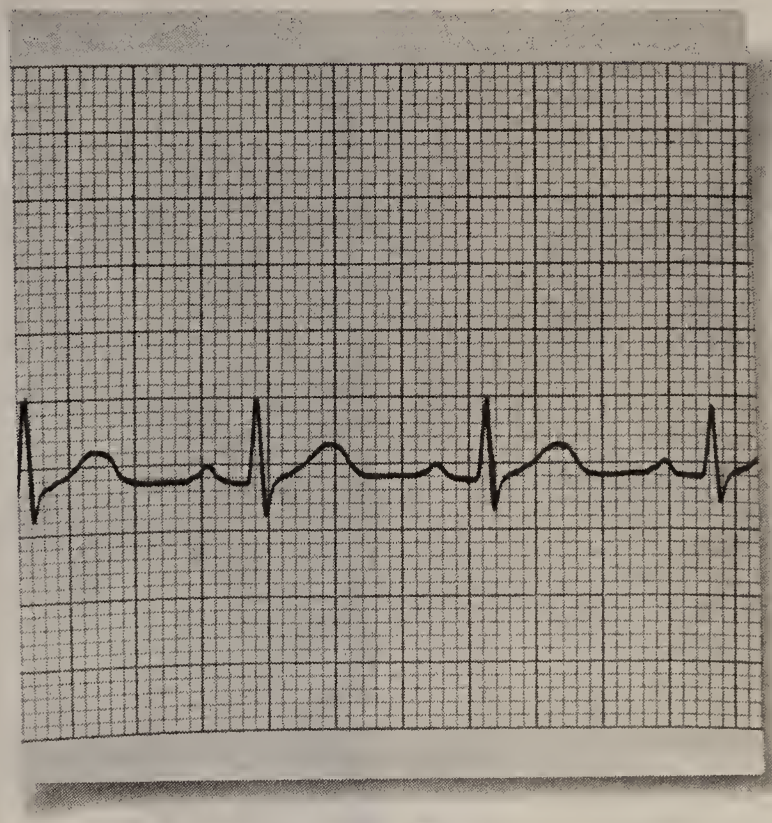

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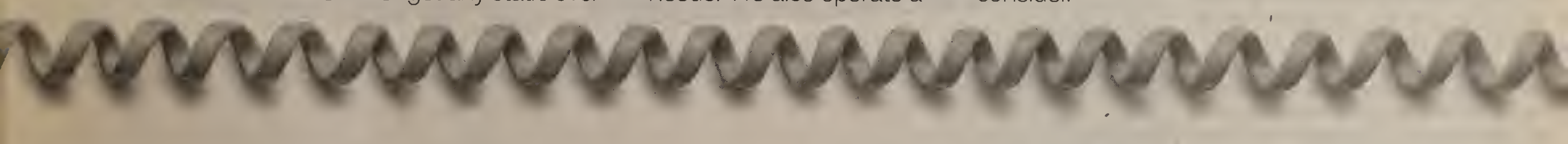

COMMUNICATIONS SERVICES VIA ITT

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International bank reins in its worldwide net

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for a number of reasons. The network was overbuilt: Projected traffic volumes never materialized. Manufacturers Hanover also had planned to take advantage of technologies such as T-1, but then foreign telecommunications authorities began to offer new and better quality data services.

In addition, some people within the giant bank questioned the network strategy. Many departmental network managers felt their needs would be better served by solutions other than GEONET.

Manufacturers Hanover now lets business units choose the networking technologies that best suit their needs. But the bank is not giving up on GEONET. Instead, it is trying to persuade the units to use the net by emphasizing its versatility and making it less expensive than other options.

A mix of satellite, microwave and dedicated facilities is used to link bank locations to switching nodes and to link nodes within GEONET. Bank customers can also access the network through dial-up facilities. Most circuits in the U.S. run at speeds of 56K bit/sec. International circuits, which are leased from foreign post, telegraph and telephone administrations, usually operate at 9.6K bit/sec.

These days, GEONET's managers regularly examine the traffic volume at each of its international locations. If a node's traffic volume is low, the traffic is converted to a public data network and private packet links are dismantled.

Bucking the trend

In rolling back its switched network, Manufacturers Hanover is bucking the general trend in the marketplace.

"They are doing things backwards," said Kathryn Korostoff, a market analyst with International Data Corp., a market research firm in Framingham, Mass. "People aren't tearing out X.25 nodes, especially in Europe. It's the first I've heard of it."

Most companies have expanded their private networks as traffic volumes justify moving from public nets, Korostoff said.

Since the traffic volumes that GEONET's planners predicted never materialized, the network was more expensive to operate than the bank had anticipated.

"One of the lessons we learned from growing the network was the importance of understanding the business requirements of our users when making projections about traffic volumes," said Stephen Bozzo, vice-president of planning and engineering. "If our users had understood clearly the real costs of using the network, they might have toned down the projections they gave us."

Current efforts to downsize GEONET, however, are bringing it closer to profitability. According to Mei Ling, the bank's vice-president and director of international telecommunications, GEONET is running at a million-dollar operating deficit this year but will soon be able to cover its costs.

In 1985, Manufacturers Hanover introduced internal tariffs for using GEONET. The tariffs — which are similar to those used by public switched networks such as Telenet — have generated $20.5 million in revenue since then. In most cases, the tariffs are less than the rates offered by the public services.

In 1979, the decision to move to a centralized network seemed like an ideal way to consolidate resources by tying together the many nets that had sprung up.

At the time, the company had 23 standalone networks, few of which were connected, that used equipment from a multitude of vendors. Communications costs were escalating at an alarming 20% a year, and the company was having difficulty finding trained personnel to support each of the networking operations.

In addition, few foreign public data networks could offer Manufacturers Hanover the transmission speeds and capacity it needed. "The idea behind GEONET was to provide any-to-any connectivity within a multivendor environment and universal usage for our customers and clients," said Roberta Frackman, manager of telecommunications at Manufacturers Hanover from 1976 to 1987.

Frackman said Manufacturers Hanover's management was receptive to her idea of an "electronic highway system" that would interconnect the bank's more than 50,000 clients, including foreign banks, U.S. multinationals and state banks.

In an era of banking deregulation, management was beginning to see that communications networks could be used for strategic advantage. For example, managers saw that GEONET could support a service that would allow customers to check the status of their accounts at any time.

Net meets resistance

Unfortunately, GEONET met resistance from several areas of the company, some suprisingly close to home. Managers of the high-speed metropolitan nets that connected several buildings in Manhattan did not want to convert their traffic to X.25 because it would slow their systems' response times. They also felt they had a sufficient traffic volume to justify the use of broadband leased circuits.

The managers also evidently resented the "top-down" way in which GEONET was imposed.

"Internal politics played a role," said Edward Regan, vice-president of network risk management at Manufacturers Hanover. "Data center managers wanted to control their own destinies as in the past."

Quite the opposite was true for overseas offices, which welcomed GEONET because it provided connectivity where none existed before, Regan said.

GEONET did not meet its objective of providing universal connectivity, but that is not necessarily a minus, according to Regan. "We provide the connectivity where it is needed, but not every terminal user is interested in communicating with every computer in the network." ◼

U.S., 111 other countries endorse treaty governing int'l networking

By Barton Crockett
Senior Writer

MELBOURNE, Australia — The U.S. last week signed an international communications treaty after winning concessions that limit the agreement's scope and thwarting efforts to impose restrictive regulations.

The U.S. endorsed the treaty along with 111 other countries at a meeting here organized by the International Telecommunications Union (ITU), an arm of the United Nations. The meeting was dubbed the World Administrative Telegraph and Telephone Conference-88.

The treaty, which will govern international networking into the next century, replaces an agreement in place since 1973.

Problems with early drafts

Initial drafts of the document included expanded network regulations to which the U.S., led by the Department of State, vigorously objected.

Early versions, for instance, called for countries to push their public carriers and private network users to adopt international standards for communications such as X.400.

Early drafts also failed to distinguish between public and private networks. That, according to U.S. delegates, could have led some nations to regulate private network users in the same way they regulate public carriers.

Representatives from the U.S. delegation said that if such requirements had not been eliminated, the U.S. would not have signed the treaty, isolating this country in the international community.

"There could have been a situation where a large block of countries signed the treaty and a much smaller block [including the U.S.] stayed out," said Daniel Clare, executive director of the U.S. delegation here. "This could have led several countries to set up regulations that American multinationals would have had a hard time dealing with."

Particularly troubling to the U.S. delegation were stipulations asking countries to ensure that carriers and private users adopt international standards wherever possible.

Such a requirement would have pushed more countries to adopt policies similar to those embraced by Japan, which earlier demanded that all international value-added networks operating in the country use X.400.

Japan recently dropped this requirement after intense lobbying against it from the U.S.

The danger with the treaty

"The danger with a document like this [a draft version of the treaty] is that it could create a situation where countries feel morally obligated to act as Japan did," said Gary Fereno, deputy director for telecommunications and information stan-

(continued on page 45)

Northern Telecom regroups operations

continued from page 4

the business units it supports, such as a facility that makes DMS-100 and DMS-10 central office switches, Fitzgerald said. This shift is expected to be completed by June.

Fitzgerald said consolidation of several telephone terminal operations here will begin early next year and be completed by the end of 1989.

The company also said it will reduce employees and output at its printed circuit board plant in Belleville over the next four months and downsize a similar facility in West Palm Beach.

Northern Telecom is looking at a number of manufacturers in the U.S., Canada and offshore countries to make the boards at a lower cost, Fitzgerald said.

Despite the cuts and shutdowns, Fitzgerald said, "There will be no diminution of Northern Telecom's research and development programs, which, over the past few years, have averaged over 11% of sales."

Despite the hefty charge against earnings, the company and analysts expect Northern Telecom to reap a profit for the year. Northern Telecom earlier reported earnings for the first nine months of this year of $200.7 million, down from $207.2 million for the first nine months of 1987. The company reported nine-month revenue of $3.92 billion, compared with revenue of $3.55 billion for the first nine months of 1987.

Analysts looked favorably upon the moves, saying the company has to keep expenses down to compete effectively in an increasingly competitive market.

"It's classic housecleaning," said Michel Guite, a vice-president and telecommunications equipment analyst at the brokerage firm of Salomon Brothers, Inc. in New York. "It's a natural modernization that I'm sure the company has seen coming since long ago."

Mark Lawrence, technology analyst at Prudential-Bache Securities Canada Ltd. in Toronto, agreed the moves put Northern Telecom in a strong position for 1990, the year he expects Bell operating companies to increasingly replace aging switches.

"Customers should be pleased by this move insomuch as [Northern Telecom] said they are not going to touch R&D spending," Lawrence said. "This is very important for its long-term technological needs."

The moves should keep Northern Telecom competitive with AT&T and other rivals in this market, he said.

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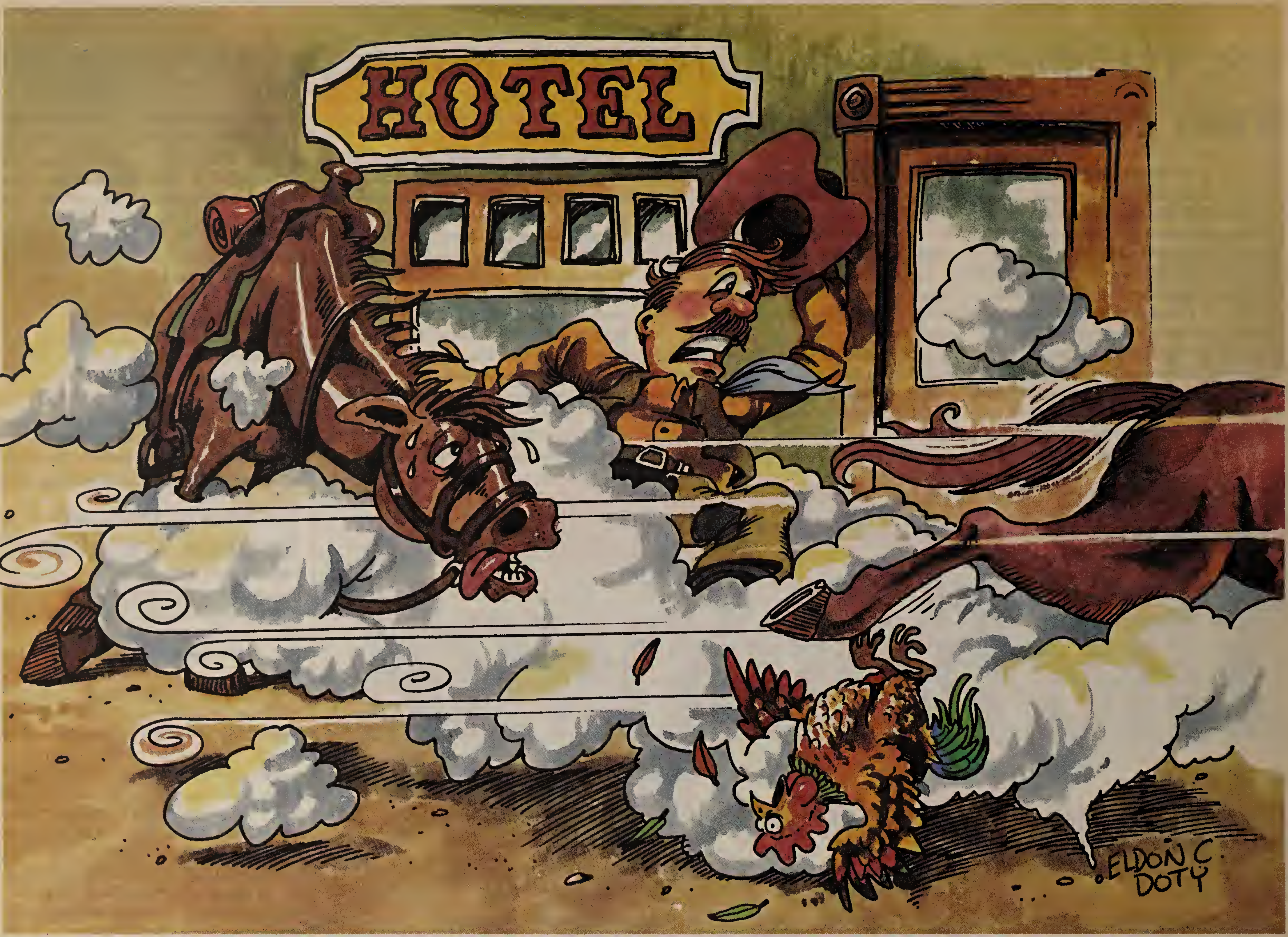

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

In a nationwide survey of 627 executives responsible for the purchase of office information systems, the Yellow Pages was named as the top source for information on prospective purchases. The Yellow Pages was named by 67% of the respondents. The survey was conducted by Decisions Center, Inc., a market research firm based in New York.

People & Positions

Orion Network Systems, Inc. recently announced the departure of co-founder and president **Paul Rampel,** effective Jan. 1.

He will be succeeded by **Catherine Carhart,** previously vice-president of development. Orion Network Systems, which is based in Berkeley, Calif., supplies IBM Systems Network Architecture communications software. The company is a subsidiary of Apple Computer, Inc.

The **Association of Field Service Managers International** in Fort Myers, Fla., last week said **G.R. Cheriton** of **Bell Canada** has been elected president and chairman of the group for 1989. Cheriton succeeds **Fred Rogers** of Unisys Corp. as head of the 5,500-member group composed of high-technology service and management professionals.

Alan Ross was appointed vice-president and general manager of **Rockwell International Corp.'s** Dallas-based **Network Transmission Systems Division.** He replaces **A.L. Pachynski,** who was named executive vice-president. Ross recently served as vice-president of the ASIC Division of National Semiconductor Corp.

CPE vendors eye Centrex customers

By Bob Brown
Senior Writer

DALLAS — Customer premises equipment vendors are increasingly turning their attention to Centrex users as the PBX market remains sluggish, said attendees at the recent North American Telecommunications Association (NATA) Unicom 2 Exposition and Conference here.

While the private branch exchange market is slowing down, aggressive marketing efforts on the part of the regional Bell holding companies and advanced capabilities are spurring Centrex growth. This turnaround has forced communications equipment vendors to focus more of their efforts on sales of equipment to Centrex users, said show speakers and attendees.

Unicom 2 attracted manufacturers, distributors, consultants, carriers and, to a lesser degree, users of communications and computer products and services.

According to a NATA study released at the show (see "Datacom sales predicted to carry net equipment mart," page 10), the PBX market is expected to be flat for the next three years. PBX sellers garnered about $3 billion in revenue in 1987, a figure that will increase slightly to $3.2 billion by 1990. Sales of Centrex will grow at a compound rate of 6.8% through 1990, while PBX sales will increase at a compound rate of 2.3%, the report said.

Paul Kirvan, president of Paul Kirvan & Associates, a Turnersville, N.J.-based telecommunications market research and consulting firm, talked during one NATA session about the customer premises equipment products of most interest to Centrex users.

Among those products are voice mail, automated call distributors (ACD) and ACD management systems, automated attendant systems and used or reconditioned communications equipment, Kirvan said. Integrated Services Digital Network equipment will also be an important opportunity, he added. Not

(continued on page 10)

INDUSTRY BRIEFS

IBM last week announced a realignment of responsibilities within its Personal Computer business operations and the formation of a new division that will develop and market advanced workstation products.

James Cannavino was named an IBM vice-president and president of the IBM Entry Systems Division. Cannavino will report to Richard Gerstner, vice-president and general manager of IBM Personal Systems. Cannavino, who joined IBM in 1963, was formerly president of the IBM Data Systems Division.

IBM also spun off a new unit, the Advanced Workstations Division, for oversight of its high-end workstations. **Nicholas Donofrio,** an 11-year IBM veteran, will be president of the new division. He was formerly vice-president of development for the IBM Entry Systems Division.

William Lowe, former president of the IBM Entry Systems Division, has resigned from IBM and taken the position of vice-president in charge of planning, developing and manufacturing at **Xerox Corp.** He will report to Xerox's president, Paul Allaire. During Lowe's tenure, IBM's Personal Computer sales grew rapidly. But sales have slowed recently, analysts said.

In 1987, IBM discontinued its first family of Personal Computers and offered the line of Personal System/2 models, which use smaller diskettes and incorporate a new internal architecture. "Lowe's greatest accomplishment was [development of] the Micro Channel Architecture in the PS/2," said Michael Goulde, director of information solutions at CAP International, Inc., a market research firm in Norwell, Mass. "While the market was shocked at IBM's abandonment of the AT bus, that move made perfect business sense for IBM."

Digital Equipment Corp. recently announced a three-pronged program designed to make computer technology more accessible and more affordable to educational institutions.

Under the Campuswide Software License Grant Program of DEC's Education Initiative, the company will grant no-cost licenses to schools for most of DEC's VAX software. The software can be used for research and instructional functions as well as administrative support functions campuswide.

(continued on page 10)

Codex marks down its modems by 30%

Analysts cite IBM's recent unveiling of modem line as main factor in the decision to cut prices.

By Bob Brown
Senior Writer

CANTON, Mass. — Responding to growing competition, Codex Corp. recently cut prices by 30% on its 2600 Series high-speed, leased-line modems and lower speed 2500 Series modems.

Analysts said Codex, a leader in the high-speed, leased-line modem market, was pressured into the price cuts by IBM's recent introduction of a new line of modems. The analysts said Codex's rivals will be forced to cut prices to keep pace with the company.

Doug Antaya

Codex expects sales of its modems to increase, according to a company spokesman, who acknowledged that margins are thin in the modem industry and that the decision to implement the price cuts was difficult.

The price reductions affect the four-channel 2680, which was reduced from $11,645 to $7,200. The 2680 supports data transmission speeds up to 19.2K bit/sec as well as synchronous and asynchronous communications.

Codex also reduced prices on most of its 2500 series modems, including the 2540, which supports point-to-point and point-to-multipoint data transmissions at up to 9.6K bit/sec. The price of the 2540 was cut from $3,995 to $2,795.

A striking resemblance

Doug Antaya, director of modem marketing at Codex, acknowledged that IBM's September introduction of new modems was one factor in the company's decision to reduce prices. The new IBM modems, Antaya said, bear a striking resemblance to Codex's 2600 modem line.

(continued on page 10)

AOS firm wants AT&T to pay for access charges

By Rex Bowman
West Coast Correspondent

WASHINGTON, D.C. — National Telephone Services, Inc., an alternative operator service (AOS) provider based in Rockville, Md., recently asked the Federal Communications Commission to force AT&T to reimburse the company for expenses it incurs when passing calls to AT&T operators.

The AOS company made the request in a petition filed last month. Last week, the Operator Service Providers of America — an association of about 30 AOS companies — filed a petition with the FCC in support of National Telephone Services' petition.

According to the petition, callers often request to be transferred to AT&T operators and the AOS provider pays AT&T an average of 45 cents in access charges for each call transferred. National Telephone Services lost about $104,000 in unreimbursed access charges in September alone, according to Brad Mutschelknaus, general counsel for the AOS company.

If the FCC forces AT&T to reimburse National Telephone Services, Mutschelknaus said the money could be passed on to customers in the form of lower rates.

National Telephone Services is also asking the FCC to force AT&T to bill customers from the origination point of the operator-assisted calls, not from the point when the AOS company passed the calls on to AT&T. Callers have complained to the FCC on several occasions about the billing procedure because users see the AOS locations and believe their bill is inaccurate. And AOS firms, not AT&T, usually get the blame.

According to Mutschelknaus, every call National Telephone Services passes to AT&T contains information on the call's origination. However, AT&T refuses to use that information for billing. "All we're asking is that the commission order AT&T to take that information and bill the end user correctly," he said.

Oshman signs with fledgling co.

By Bob Brown
Senior Writer

LOS GATOS, Calif. — M. Kenneth Oshman, former chief executive officer and president of Rolm Corp., recently joined startup company Echelon, based here.

Oshman will serve as president and CEO of Echelon, which was founded in February by a former top executive of Apple Computer, Inc. The company will attempt to develop what it calls a universal local operating network that will be used to control a variety of devices, including building security systems and factory automation equipment.

In contrast, local networks are used to transmit data among computers and other devices.

Oshman is teaming up with Echelon founder A.C. Markkula, a cofounder of Apple. Markkula will be chairman of the board.

Industry observers have been wondering where Oshman would resurface since he left IBM in 1986. He joined IBM in 1984 when it acquired private branch exchange maker Rolm. Oshman served as a vice-president and a member of the IBM Corporate Management Board.

The challenge Oshman and Markkula have taken on is to develop a network that can work with all the devices a user might want to support within a building.

"Local operating networks represent the next revolution in the fields of computing and communications," Oshman said. How long it will take to develop a universal local operating network and how Echelon will accomplish this feat are still unclear, he said.

An Echelon spokesman said that communications managers in most firms are not responsible for the types of devices controlled by local operating nets. But that will probably change in the future. For example, he said, net managers probably will be responsible for computer networks as well as security networks.

Local operating networks may even be used to monitor the status of local nets, alerting users to downed links or problems with nodes, the spokesman said.

Analysts said Echelon will probably fare well. Both Oshman and Markkula have proven they can transform start-up firms into solid companies.

Codex marks down modems

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"I sense IBM had us in mind when they introduced those products," he said.

IBM's 7860 series of network management modems supports data communications at speeds up to 19.2K bit/sec and has multiport capabilities. Many of IBM's new modems, such as the 7891 model that supports data speeds up to 19.2K bit/sec and will sell for $7,200, will not be available until late next year.

> "IBM had us in mind when they introduced those [modems]," Codex's Antaya said.

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Josh Gonze, a research analyst at market research firm International Data Corp. in Framingham, Mass., said he expects Codex's move to prompt other major players in the high-speed modem market, such as General DataComm, Inc., Paradyne Corp. and Racal-Milgo, to cut their prices in the next three months.

"I think this announcement is important because Codex is a pacesetter," Gonze said. "All modem vendors who sell high-end, leased-line modems will have to react in some competitive way."

But a Paradyne spokeswoman said her company considered Codex's modems high-priced in the first place and said that Codex is trying to bring its prices more in line with other market leaders. Paradyne sells its four-port 3481 modem, a 19.2K bit/sec standalone model, for $7,520. Paradyne has no plans at this time to cut prices, she said.

Bill Victoria, director of network management systems at General DataComm in Middlebury, Conn., said the company announced price cuts on some of its major modems in late summer (from $8,495 to $7,995 on its NMS 19.2K bit/sec modem, for example) and will continue to stay competitive on a price basis. He would not say whether the company will respond to Codex's cuts with markdowns of its own.

A Racal-Milgo spokesman said his company "is not interested in getting into a price war. We are a conservative company."

A Codex spokesman acknowledged the company sells its products at a premium price.

In addition to the price cuts, Codex said it will try to attract new users by making its Enhanced Dual Dial Restoral feature standard on its four-channel 2680 modem. The formerly optional feature automatically switches traffic to a dial-up link if a leased line fails.

Upgrade policy

Codex also announced a new upgrade policy that encourages users of low-speed Codex modems to upgrade to higher speed modems. Upgrade prices vary depending on the level to which a product is upgraded.

Datacom sales predicted to carry net equipment mart

Telecom products will contribute little to growth of industry, according to NATA market analysis.

By Bob Brown
Senior Writer

DALLAS — The U.S. network equipment market is expected to grow at a 7% annual rate through 1990, largely due to strong sales of data communications, facsimile and voice-messaging products, according to a report from the North American Telecommunications Association (NATA).

The report, which was released at NATA's recent Unicom 2 Exposition and Conference held here, predicts sales of telecommunications equipment such as private branch exchanges, central office switches and key systems will contribute little to the network equipment industry's overall growth. These individual markets are expected to show less growth.

The NATA report says sales of traditional voice equipment will be flat for several reasons, including renewed user interest in Centrex and the introduction of integrated voice/data networking equipment.

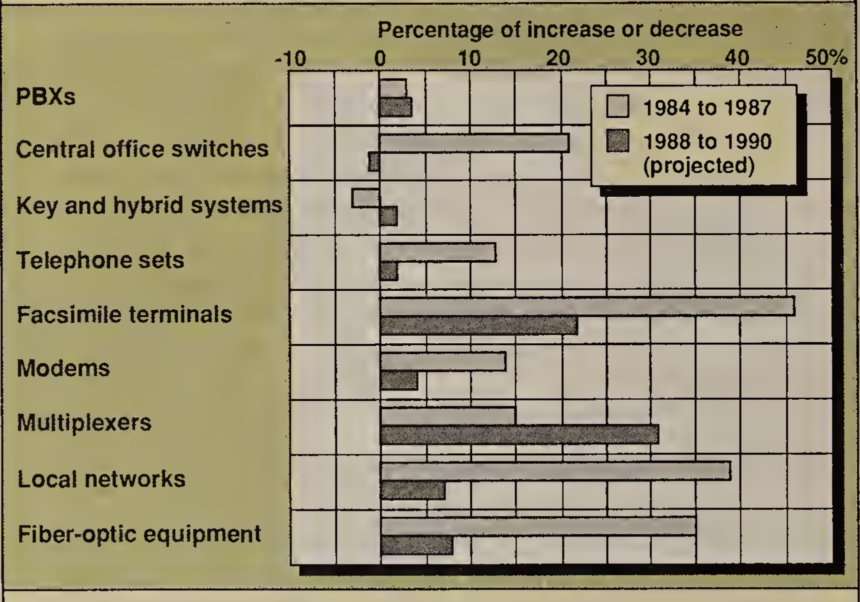
Revenues from sales of communications equipment are expected to increase from $28.5 billion in 1987 to $33.8 billion by 1990. The market is not growing as fast as previous years. For example, revenues rose about 11% annually from 1984 to 1987, increasing from $20.9 billion to $28.5 billion.

The study also found that:

- The data communications equipment market, which includes products such as multiplexers, packet switches and local network servers, is expected to increase from $4.8 billion in 1987 to $7.8 billion by 1990.
- The facsimile market is projected to skyrocket from $539 million in 1987 to $1.6 billion in 1990, nearly a threefold increase.
- The market for voice- and call-processing equipment, which was worth $850 million in 1987, is expected to surge to $2 billion by 1990.
- The PBX market, which grew from $2.8 billion in 1984 to $3 billion in 1987, is expected to creep up to $3.2 billion by 1990.
- The key and hybrid telephone system market, which was worth slightly less than $1 billion in 1987, is projected to increase to just above $1 billion by 1990.

For more information about the NATA 1988 telecommunications market report, write to: NATA Publications Department, 2000 M St., N.W., Suite 550, Washington, D.C. 20036, or call (202) 296-9800.

Communications equipment market growth



SOURCE: NORTH AMERICAN TELECOMMUNICATIONS ASSOCIATION, WASHINGTON, D.C.
GRAPHIC BY SUSAN J. CHAMPENY

CPE vendors eye Centrex users

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only are these customer premises equipment products in demand, he said, but they also carry impressive profit margins.

Vendors of customer premises equipment said they are taking an "If you can't beat them, join them" approach toward Centrex, an offering NATA members have often criticized as being technologically inferior to PBXs.

"PBXs still have the technological edge, but [customer premises equipment] vendors must realize that Centrex makes sense for many users," Kirvan said.

Steve Paddock, marketing manager at Toshiba America, Inc.'s Telecommunication Systems Division in Irvine, Calif., and a NATA member, said the RBHCs have become increasingly aggressive in their Centrex marketing efforts since divestiture.

"They took another look at their most valuable resource — their network," said Paddock, whose company sells telecommunications products such as PBXs and key systems.

But many NATA members said there are still opportunities in the PBX market.

"There are ways to beat Centrex other than with pricing," said Edwin Spievack, NATA president. "By providing good service, [vendors] can differentiate themselves."

While Paddock said he does not see a general shift away from the PBX, he said the Centrex market is becoming increasingly important.

"Every Centrex system needs [customer premises equipment] behind it," Paddock said. "If we can't sell a customer a PBX, we'll try to sell them products that work with Centrex."

Another way vendors can take advantage of the resurgence of Centrex is through the sales agency program imposed on the RBHCs by the Federal Communications Commission in 1985, said Edward Lavin, president of TIE Systems, Inc., a division of TIE/Communications, Inc. in Stamford, Conn. Lavin is vice-president of sales for TIE/Communications, which specializes in manufacturing and selling key systems.

The program gives independent vendors the chance to sell Centrex and network services for a commission from the RBHCs.

Some vendors have criticized the program, saying the RBHCs are less than enthusiastic about working with other firms. But, Lavin said, "The sales agency program has been a salvation for some interconnects. It's a sign of the evolution of the industry."

Industry Briefs

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The second program is an expansion of DEC's Education Software Library, a software distribution and support program. This program was expanded to include users of all VAXes.

The third program, The Campus Service Agreement, lets educational institutions use their own personnel for hardware maintenance while receiving backup support from DEC. Under this agreement, DEC's monthly charges are about 75% less than the charge for DEC's standard on-site service agreement.

Northern Telecom, Inc. last week announced the sale of 150 miles of TubeStar fiber-optic cable to PTAT Systems, Inc. for the U.S. portion of PTAT-1, the first privately owned transatlantic fiber-optic cable. The PTAT cable will tie U.S. financial and business centers to those in Europe.

Northern Telecom cable will be used in two segments. One will link the submarine facility, where the undersea cable links to the U.S. in Manasquan, N.J., to the PTAT city terminal in New York; the second segment will run from the New Jersey terminal to a terminal in Philadelphia. The terminals are the hubs at which end users link to PTAT-1.

TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

Early users of AT&T's Integrated Services Digital Network Primary Rate Interface received automatic number identification — the telephone number of the calling party — with an average of 50% to 70% of their incoming calls. This percentage will increase in tandem with deployment of the service, according to John Kauza, ISDN product management director for AT&T.

Carrier Watch

FiberLAN, Inc. announced it will build a 13-mile fiber-optic route that will wind through downtown Houston's business district. The city awarded **Network Communications, Inc.** a contract for construction of the system, and Network Communications subcontracted the business to FiberLAN.

Based in Research Triangle Park, N.C., FiberLAN said it will begin building its part of the network immediately and expects to finish the project in six months.

The fiber-optic system will serve about 30 buildings, including the city's corporate offices and interexchange carrier offices, according to FiberLAN. The company plans to begin offering connections to the fiber-optic system in early 1989.

Microtel, Inc., a subsidiary of **Advanced Telecommunications Corp.**, has introduced a WATS service in Florida and Georgia targeted at users that spend $8,000 or more each month on long-distance calls.

Dubbed Corporate LaserExpress, the service gives businesses in the two states the ability to place calls anywhere in the U.S. or to 140 foreign cities.

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Access line and revenue update

RBHC	Access lines (millions)	Operating revenue (billions of dollars)
Ameritech	15.36	$8.14
Bell Atlantic Corp.	16.61	$9.39
BellSouth Corp.	15.74	$11.10
Nynex Corp.	14.65	$10.75
Pacific Telesis Group	12.80	$11.06
Southwestern Bell Corp.	11.29	$7.13
US West, Inc.	11.76	$7.51

Figures are for 1987.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: FCC, WASHINGTON, D.C.

Los Angeles shopping for net optimization system

City seeks $750,000 annual savings, issues RFP.

By Bob Wallace
Senior Editor

LOS ANGELES — The city of Los Angeles last week issued a request for proposal for a network design and optimization system that it will use to cut costs and improve network efficiency.

The city has struggled to manage its voice network, which uses several thousand Centrex lines and about 100 tie lines to support roughly 300 police and fire department sites as well as city agencies in three local access and transport areas.

More than half of the $8 million to $11 million the city pays for network services each year is spent on local calls.

The city estimates it will save $750,000 a year after the first round of network optimization.

"That's a conservative estimate of what we can save by properly handling off-network calls, improving tie line performance and eliminating telephone system abuse," said Nancy Jesuale, long-range planning chief for the city's telecommunications department.

> Over half the $8 million to $11 million the city pays for net services is spent on local calls.
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The department is shopping for design and optimization software, as well as a dedicated processor to support the applications. Jesuale said the department would prefer a minicomputer-based system but will consider proposals specifying software that works with current applications on the city's IBM mainframe.

Vendor proposals will be evaluated on system versatility, cost, and the type and variety of usage reports they generate. The city would not say how much it will spend on the network design and optimization system.

"We need a system that provides detailed management reports and uses updated rate tables so we can model different network options before we try any of them," Jesuale said.

> The city would not say how much it will spend on the design and optimization system.
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"If we need to [add a new net link], we want to be able to compare the cost of a circuit on our microwave data net with the cost of a [Bell operating company-provided] leased line," she said.

The need for network modeling capabilities arose at the same time as the city's need for detailed service usage data. "When we used analog Centrex, we got call-routing information but no traffic reports," Jesuale said. The city continued to press Pacific Bell for usage data but to no avail.

"We had many discussions with Pacific Bell about these needs, but the [information and reports] they offered were too expensive and lacked detail," according to Jesuale.

"[The BOC] could only tell us whether or not the tie lines were busy. We needed to know how they were being used," she said.

All reponses to the city's RFP are due this week and will be analyzed by the end of January. Jesuale said the contract will be awarded shortly thereafter. ◼

Bank tallies savings in telemanagement

Bankers Trust installs software to streamline telecom operations, decrease overtime costs.

By Rex Bowman
West Coast Correspondent

NEW YORK — Bankers Trust Co. expects to save more than $300,000 per year by implementing a telemanagement system designed to cut overtime costs and reduce the number of employees needed to administer network changes.

The international bank is installing Automated Telemanagement System (ATMS) software to manage a network of approximately 15,000 telephones and related cabling in three New York offices and in its Harborside, N.J., data center.

Bankers Trust hopes the system will help it maintain better information on network equipment and wiring, eliminate interdepartmental billing problems and speed equipment repairs.

ATMS is developed and sold by The Info Group, Inc. of Framingham, Mass.

According to Geoff Penney, senior vice-president of telecommunications for Bankers Trust, the bank spent more than a total of $750,000 for both the ATMS package and a Digital Equipment Corp. MicroVAX 3600 computer to run it on.

But after the system becomes operational in the spring of 1989, the bank expects to begin saving more than $300,000 per year, mostly in reduced clerical costs, Penney said.

"On average, we make some change to each of those 15,000 phones each year," Penney said. "We move furniture around, or someone moves from one place to another, or they want different features, or they want a multiline phone. So we're dealing with roughly 15,000 telephone work orders a year."

Each work order typically involves a change to the bank's private branch exchange software, which often requires cabling and electrical work. All work is billed to the department that requests the change.

Bankers Trust began to look at automating the processing and the tracking of work orders three

(continued on page 12)

WASHINGTON UPDATE

BY ANITA TAFF

Following the rules. Although the existence of Consent Decree restrictions makes a coherent and effective national telecommunications policy nearly impossible, the regional Bell holding companies do not have the right to violate them, said Charles Rule, assistant attorney general in the Antitrust Division of the Department of Justice.

Speaking at a recent conference sponsored by the Practicing Law Institute and the Federal Communications Bar Association, Rule said RBHC executives and employees who ignore Consent Decree restrictions could face criminal prosecution and imprisonment. Rule has publicly stated that he believes Consent Decree restrictions should be lifted. But he said change must come through Congress or the courts.

Rule suggested two ways the RBHCs can protect themselves from possible decree violations: make certain that all employees are fully informed on the Consent Decree requirements and obtain a waiver from the Department of Justice before engaging in any prohibited activity.

The future of the FCC. A recently released Heritage Foundation report urged the incoming presidential administration to abolish the Federal Communications Commission and transfer its responsibilities to the U.S. Department of Commerce.

The report, entitled "Mandate for Leadership III: Policy Strategies for the 1990s," said the Commerce Department should be given oversight of the telecommunications industry. The National Telecommunications and Information Agency, which presents the administration's views on telecommunications policy, is already part of the Commerce Department.

(continued on page 12)

Washington Update

continued from page 11

The conservative research institute said telecommunications is so important to the U.S. that it warrants cabinet-level oversight.

The Heritage Foundation also urged elimination of Consent Decree restrictions on the regional Bell holding companies and removal of rules prohibiting telephone companies from purchasing cable television companies.

AT&T delays HNS. At the request of the Federal Communications Commission, AT&T recently delayed the effective date of its revised Hospitality Network Services (HNS) tariff to Dec. 19.

The HNS tariff originally specified a rate of 18 cents per minute for companies that guarantee usage of four million minutes of 1 + traffic per month.

AT&T filed a revision of the tariff on Oct. 20 asking the FCC for permission to lower the rate to 16.5 cents per minute. AT&T said the reduction is necessary to retain the only current HNS customer, Marriott Corp., and to attract new customers.

RBHC files tariff revision. Southwestern Bell Telephone Co. last week filed tariff revisions to enable it to conduct court-ordered balloting of pay phone operators next year.

The regional Bell holding companies were ordered by U.S. District Court Judge Harold Greene to allow pay phone owners to choose a long-distance carrier. Previously, all long-distance traffic from RBHC pay phones was routed to AT&T. The RBHCs must send ballots out by Jan. 1.

Bank tallies savings in telemanagement

continued from page 11

years ago. The bank, which asked 22 vendors to submit possible solutions, chose The Info Group's software package earlier this year.

ATMS will run on the MicroVAX 3600 at the bank's building here. The 3600 will be tied to as many as two dozen dumb terminals and personal computers in the building's net management center.

From paper to personal computers

The system will do away with some of the paperwork involved in processing service orders, tracking cabling and the location of phone equipment, billing departments for service and keeping track of equipment that needs repair.

Now, for instance, if the telecommunications department wants to know how a particular office is wired, it would have to send a person to that office.

"If someone calls up and says he needs to move 150 people from the seventh floor to the 26th floor and these are the types of telephone sets he needs, then, from your personal computer screen, you would identify the cable connections, know if you have that equipment available, where that equipment is going to go, and what you have to do to your switch to install the equipment," said John Dretler, president of The Info Group. "It's all in the data base."

When phone equipment is moved around, the changes are entered into the ATMS data base by a Bankers Trust employee working at one of the terminals. The Info Group has already completed the initial loading of the data base information and is in the process of training Bankers Trust employees to use the system.

"This doesn't totally automate the process," Penney said. "You still need an electrician to lay a cable. But it enables us to keep track of the work that's flowing through the department."

Bankers Trust is also considering the use of ATMS for call accounting, directory services and automation of some similar manual processes in its data communications department.

Carrier Watch

continued from page 11

Rates for the service are from 13% to 21% lower than AT&T's Megacom WATS rates, according to Microtel.

Corporate LaserExpress is billed in six-second increments and offers such features as project account coding and paper- or magnetic tape-based call detail recording data. Project account coding can be used to bill separate departments for calls placed. This requires each department to enter a different three-digit code after the seven- or 10-digit telephone number.

Norlight, a regional long-haul carrier owned by four Wisconsin utilities, said network extensions to Green Bay, Appleton and Oshkosh, Wis., will require the addition of 128 new route miles.

The network already serves cities in Illinois, Minnesota and Wisconsin, including Chicago, Minneapolis, Milwaukee, and Madison and La Crosse, Wis.

Norlight expects to complete the construction project in the spring of 1989.

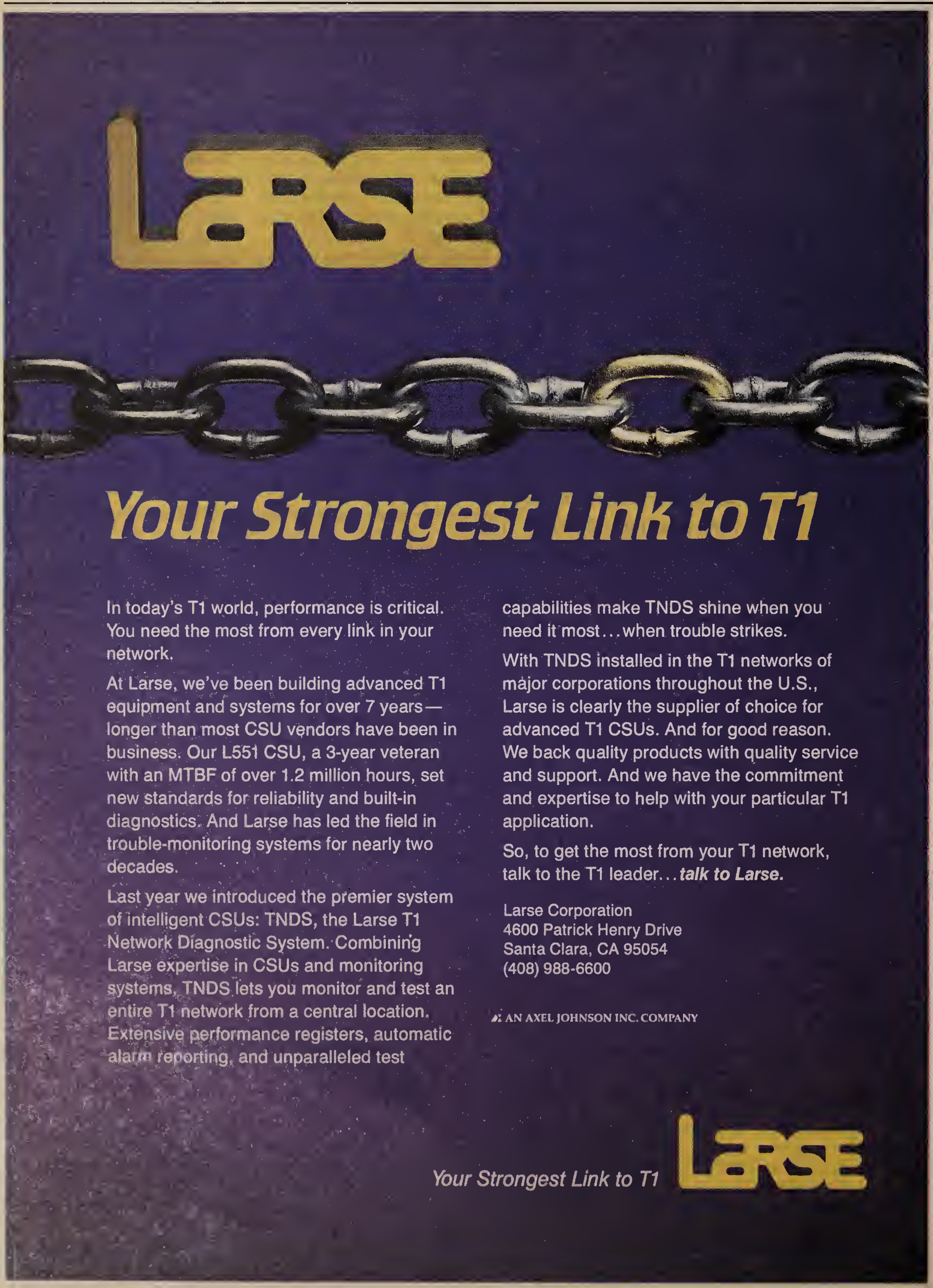
The four utilities that own Norlight are Wisconsin Public Service Corp., Wisconsin Power & Light Co., Dairyland Power Cooperative and Madison Gas & Electric Co.

U.S. Transmission Systems, Inc. (USTS), the long-distance telephone unit of ITT Corp., has reduced rates for its WATS 200 service users in South Carolina.

The carrier said the 3% reduction in rates will make them roughly equal to AT&T rates for similar service. Designed for customers that spend more than $500 a month on long-distance calling, WATS 200 requires dedicated access.

USTS also said it has lowered rates an average of 20% for Smart-WATS calls originating and terminating within Maryland. The reduction brings Smart-WATS rates in line with AT&T's rates for comparable service, the company said. Smart-WATS is designed for subscribers that place more than 45 hours of long-distance calls per line per month.

The reductions took effect Dec. 1.



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Worth Noting

"Packet switching has moved into the mainstream of MIS managers' data networking strategies. The networks now being established are perceived as utilities that should have connectivity to public facilities as well as private facilities."

From ***Packet Switching Markets in the U.S.***
A new report by
Frost & Sullivan, Inc.
New York

Data Packets

Telenet Communications Corp. recently announced hardware discounts for users of its Telenet Public Data Network.

Users that agree to a contract of one year or longer will be eligible for a discount of almost 70% on networking hardware sold by Telenet, which includes packet switches, concentrators and packet assembler/dissasemblers. Users can also renegotiate existing contracts to take advantage of the discounts.

The discounts will be offered until March 31, 1989.

Telenet, a US Sprint Communications Co., is located at 12490 Sunrise Valley Drive, Reston, Va. 22096; or call (703) 689-5000.

Pacific Bell recently announced it will provide protocol conversion for asynchronous data transmitted over its Public Packet Switching network for users in the San Francisco and Los Angeles areas.

Asynchronous traffic will be converted to X.25 for transmission within Pacific Bell's service area or to X.75 for transmission beyond its boundaries. For more information, users should contact their Pacific Bell representative. ◘

BELLCORE develops new packet switch

Customized microprocessors let the broadband switch deliver high-bandwidth net services.

By John Cox
Senior Editor

Engineers at Bell Communications Research, Inc. have demonstrated a prototype of an advanced packet switch that promises to support a new generation of high-bandwidth network services.

Described by BELLCORE as a broadband packet switch, the device uses customized microprocessors that support an experimental switching system within the hardware. This switching system handles the sorting and routing tasks that are accomplished by software on existing packet switches.

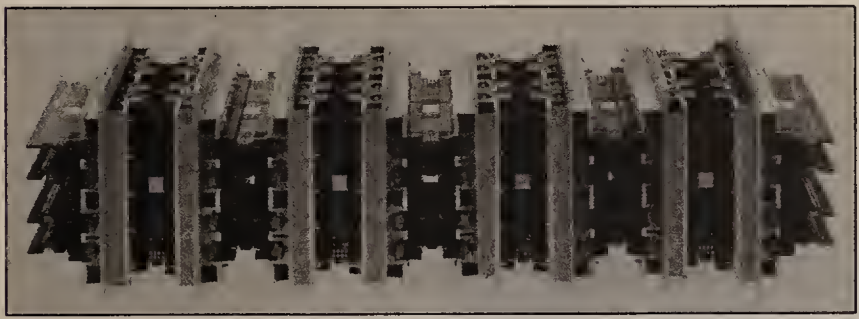
The prototype, which supports 64 communications lines with data throughput of 100M bit/sec, was demonstrated in October at the research consortium's annual meeting with its sponsoring regional Bell holding companies in Phoenix.

Researchers are building a larger version of the broadband packet switch that will support 256 communications lines, each with a data speed of 150M bit/sec, for a total throughput of more than 35G bit/sec.

BELLCORE's goal is to provide the RBHCs with a device that can switch any kind of digitized information — voice, data or video — at very high speeds over high-capacity links, according to David Sincoskie, BELLCORE's division manager for packet communications research.

Such an advanced packet switch will play a key role in the deployment of broadband Integrated Services Digital Network, which will provide vast bandwidth to support advanced inte-

(continued on page 15)



BELLCORE's prototype broadband packet switch, with gigabits-per-second throughput, will be a key part of future public data nets.

CDROM disks may lower users' info service costs

By John Cox
Senior Editor

NEW CANAAN, Conn. — Distribution of high-capacity optical disks may reduce the price users pay for information services and may cost data communications service providers millions of dollars, according to a study recently released by International Resource Development, Inc. (IRD).

Today, users access an array of text, economic and financial data bases over dial-up links, said Kenneth Bosomworth, president of IRD, a market research and consulting firm based here. Users pay not only for the information but for transmission service. According to Bosomworth, as much as 80% of a data base publisher's gross revenue may go to cover telecommunications costs.

But in the future, service providers may distribute information on CDROM disks, obviating the need for transmission services. Vast amounts of data can be stored permanently on these relatively small optical disks, which are read by a laser.

But distribution of information on CDROM will cost network service providers.

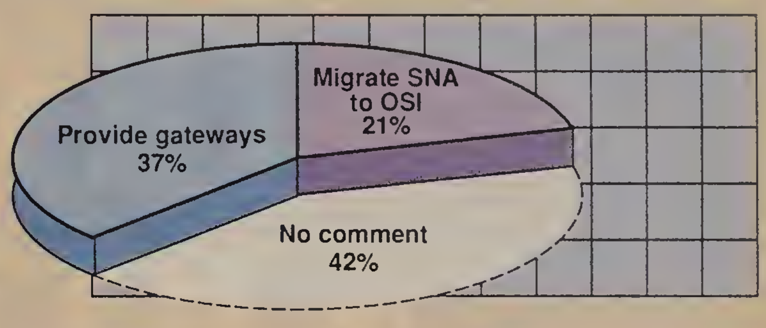
Bosomworth said that within five years, some $100 million worth of expected data communications service revenues will evaporate as a result of data base publishers migrating to CDROM from on-line services.

Frequent users of on-line data bases are the most likely beneficiaries of such an information distribution method. The compact disks will probably be used in applications in which up-to-the-second data is not required, Bosomworth said. Corporate users will continue to rely on on-line data services for such time-sensitive data as stock prices, for example.

(continued on page 44)

Users seek SNA/OSI coexistence

Would you prefer IBM to offer gateways between SNA and OSI, or would you rather see IBM migrate SNA to OSI?



Figures are based on interviews with 42 SNA users.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

Users explore voice/data integration at trader meet

Technology could be helpful if users can adapt.

By Paul Desmond
Staff Writer

NEW YORK — Users at a recent seminar here, entitled "Voice/Data Integration in the Trading Room," agreed that integrating voice, data and video networks in financial trading centers could provide a number of benefits, but only if management and traders can live with the changes it will bring.

Networks that support telephone service as well as transmission of video and data promise to increase trader productivity by automatically providing traders with, for example, detailed customer information with each outgoing or incoming call. Currently, most traders use separate terminals to control voice lines and various data sources.

Integrated voice/ data networks will also make it easier to track which calls produced trades, making it easier for traders to budget their time.

But industry analysts and managers at trading companies said it may be difficult to convince traders to adopt the new systems because they are comfortable with the current separate voice/data format. They said the systems cannot increase productivity if traders are unwilling or unable to use them.

In addition, integration could lead to disputes between telecommunications and data communications departments at trading companies over how to manage the networks.

The seminar, sponsored by Waters Information Services, Inc., brought together about 50 users, vendors and analysts.

Users sought answers on how to integrate the voice and data equipment in their trading rooms, where a myriad of financial products ranging from equities and bonds to Treasury bills are traded.

Most traders currently use a personal computer-based system to receive market information. This information is received over video feeds from various data providers, and text data is received from internal sources. Traders often have a variety of screens and keyboards stacked on their desks with multiple links to information sources.

In addition, each trader has a turret, a device connected to the trader's phone that has numerous buttons configured to correspond to multiple phone numbers. For example, a turret from Contel IPC with 40 buttons supports up to 200 phone numbers.

> The systems cannot increase productivity if traders are unwilling or unable to use them.
>
> ▲▲▲

Traders typically have direct lines to their biggest customers and dial-up lines to others. But in either case, they can be connected at the touch of a button. The turrets replaced the multiple phone sets that cluttered traders' desks until the early 1980s.

Steven Steinberg, a senior vice-president at Prudential-Bache Securities, Inc. in New York, said integrating voice and data into a system with a common interface could result in turf wars between telecommunications and data communications departments at trading firms.

Prudential-Bache's communications department, for example, is organized into a telecommunications group that handles the turrets and a systems group that supports data communications.

"You have to bring these two groups together in order to get to

(continued on page 15)

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Users explore voice/data

continued from page 13

the next step," Steinberg said. "Maybe we have to integrate ourselves before we integrate the trading floor."

Another problem cited by Steinberg and others is getting traders to give up the systems they are accustomed to in favor of integrated workstations. Also, since data from outside sources is available only during trading hours, it would be difficult to test systems on a large scale other than under actual trading conditions.

Razy Hirschberg, vice-president of Eximin Telecom, a consultancy and software developer, is a project manager for trading room redevelopment projects in New York. He questioned whether most traders would be willing to adapt to a new voice/data system. "I think the traders, given a choice, would still live with 10 different keypads at their trading desk," Hirschberg said. "They would live with basically what they've had for years because that's what they're used to."

"Traders, given a choice, would live with 10 different keypads," Hirschberg said.

▲▲▲

He said integrated voice/data workstations would not increase productivity if traders are unable or unwilling to learn how to use them. Steinberg agreed, saying that about two-thirds of Prudential-Bache traders are not technically oriented and may balk at having to learn a new system.

"I think, on the whole, the typical trader is voice-oriented," Steinberg said. "He's not a technically inclined person, so whatever we do has to be simple."

Answer looking for problem

Anthony Paxton, vice-president of global trading at the Canadian Imperial Bank of Commerce (CIBC) in Toronto, agreed that integration is a matter more on the minds of technical people than end users. He called integration "a solution looking for a problem."

"I certainly don't have hordes of traders pounding on my door every day demanding voice and data integration," he said.

But Paxton acknowledged that integrated systems would save time and increase productivity by providing traders and salespeople with customized information on a per-call basis.

CIBC is planning a two-phase beta test of an integrated system at its New York trading office, where a new voice/data system was installed in mid-November.

In the first phase of the test, planned for next month, new touch-screen turrets provided by Wyatts will be integrated with a data delivery system from Rich, Inc., both subsidiaries of Reuters Holdings PLC of London.

When traders select an incoming or outgoing phone line, they will automatically be provided with screens previously selected for each customer. The screens may, for example, contain current financial data from selected sources, such as Reuters or Telerate Systems, Inc., tailored to the financial products the customer is likely to buy.

Phase II will involve linking the turret system to CIBC's in-house computer network. Personal computer-based workstations are linked over an Ethernet local network to a file server and an IBM System/36 minicomputer. Traders will be able to log on to any workstation and obtain customer profile information arranged in the trader's own format. The profiles could even include information on customers' personal interests to help traders make conversation.

In addition, the system will let the company record data detailing which calls resulted in trades and the amount of those trades.

Eventually, when automatic number identification becomes available, Paxton said he hopes to integrate the call tracking information with an automatic call-selection system. If multiple calls came in simultaneously, the system would use the call tracking data to ensure that the fist call selected is the one that is most likely to result in a trade.

Hirschberg said many users are not yet willing to integrate their voice and data sources into a single system. "Do you want to put all your eggs in one basket?" he asked after the seminar. "[Users] would rather get the feeling that they have two separate systems, primarily because they want contingency."

Once trades are placed, another problem currently exists in entering buy or sell orders. Now, most companies use runners who take handwritten slips from traders' desks to a data-entry clerk who must manually enter the trade data into the company's computer system for processing and confirmation.

Robert Nagle, chairman and chief executive officer of VOIS, Inc. in New York, told the attendees that his company is working on a voice recognition system that could simplify that process. Rather than basing the system on word recognition, which is dependent on a particular user's voice, Nagle's system would recognize individual phonemes, or word components that make up speech.

He said a voice recognition system will eventually be developed that can handle order entry and confirmation in the clamorous trading room environment, but such a system is unlikely to be available in this decade. ◼

BELLCORE develops packet switch

continued from page 13

grated net services, he said.

Using broadband packet switches, carriers will be able to support, for example, high-bandwidth applications such as image data bases and full-motion video. One of the first services that carriers are likely to offer based on broadband switching is powerful central office-based local networks. These high-capacity, high-speed networks will, in some cases, supplant dedicated private networks, Sincoskie said.

Packet-switch history

The first packet switches were developed in the early 1960s as a way to link computers over nondedicated facilities, Sincoskie said. Today, packet switching most often supports low-speed data communications, often using the X.25 protocol.

Vendors and researchers are continually striving to increase the throughput of packet switches. For example, Codex Corp. has worked with StrataCom, Inc. to develop a modified version of a StrataCom "fast packet" switch that packetizes voice and data. The Codex 6290 has a throughput rate of about 160,000 packet/sec, compared with about 5,000 packet/sec for a traditional switch, according to Carl Megelich, director of digital networking marketing for Codex.

The BELLCORE broadband switches dwarf the Codex/StrataCom device. The specialized chips and internal routing scheme designed for future broadband packet switches will eventually support hundreds of 150M bit/sec trunks, Sincoskie said.

Packet switching is a variant of time-division multiplexing (TDM), which divides a transmission channel into frames of fixed time periods and then divides the frames into several time slots, according to Sincoskie. With TDM, one telephone call is transmitted in each time slot and the same pattern of slots is repeated in every frame.

BELLCORE's switch achieves higher throughput by using an internal switching system.

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According to Sincoskie, the nature of TDM means that network resources are dedicated to a phone call from the time the call begins to the time it ends, even when no information is actually being transmitted.

In contrast, a packet switch assigns packets of digitally encoded information to the time slots, creating a "circuit" only when information is actually being sent. As a result, the network's capacity can be allocated as it is needed. The switch would transmit more packets for high-speed data or video and fewer for telemetry or voice traffic.

Current packet switches, based on small, general-purpose computers, read a packet into memory, interpret the header information and then "write" the packet to an output trunk, Sincoskie said. A switch must execute hundreds of instructions to switch a single packet.

BELLCORE's David Sincoskie

By using hardware instead of software to perform packet-switching tasks, the broadband packet switch will eliminate or reduce two drawbacks of packet switches, namely greater delay and complexity, he said.

BELLCORE's broadband switch achieves much higher throughput by using an internal switching system called the Batcher-banyan switch. This system reduces the amount of processing needed for each packet and spreads the processing task over many switching cells working in parallel.

This switching fabric is implemented in silicon in high-speed, very large-scale integrated circuits. But as researchers arranged greater numbers of these switching cells to build larger switches, they found that the interconnection patterns became highly complex and the switch slowed down.

They then hit on the idea of creating a switching module by arranging columns of switches on circuit boards mounted at right angles to each other (see photo, page 13). The arrangement dramatically reduces the interconnection complexity and yields much higher speeds, according to Sincoskie.

This architecture was the basis of the prototype switch BELLCORE demonstrated in October and the larger switch now being built. In the future, very large central office switches will comprise several hundred such modules, with more than 10,000 lines at 150M bit/sec each for a total throughput of 1,000G bit/sec.

One major hurdle still blocking commercially viable broadband switches is the control and management of broadband packet nets. Such networks will have different types of traffic, each with its own characteristics. In such an environment, net management is a complex job.

Introduction of SMDS

One of the earliest uses of broadband switches is likely to be in an ISDN application called Switched Multi-megabit Data Service (SMDS). SMDS allows users to interconnect geographically disparate local networks through the public network. Instead of ordering dedicated circuits from a public carrier and building their own networks, corporate network managers will simply order SMDS lines for the sites they want to interconnect.

Target market

Broadband packet switching is a means of implementing SMDS data services for a clearly defined set of corporate customers, according to Gary Nelson, senior director of broadband technologies for Ameritech Services, Inc., a division of Ameritech. "It's being targeted at high-end data customers with DS3 pipes into their facilities," he said.

In a typical large corporate account, Nelson said, about 10% of the computing sites create about 50% of the traffic. This traffic is ideally suited to private data nets, he said. But the rest of the customer's sites are prime candidates for what a carrier-based broadband service like SMDS can supply.

"These smaller outlying offices don't have enough traffic to be cost-effectively connected directly to the private network," he said. The alternative is a packet service that links these sites into a public network with a response time so fast that they seem to be directly connected to a high-speed local network. ◼

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Moderator:* Bruce Hoard, *NetworkWorld
Dan Richards • Howard Frank • David Edison
James Herman • William Gilbert • Peter Hicks

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● Benefits

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- Does IBM control the market and dictate network management standards with Netview and Netview PC?
- Does the international Standards Organization Open Systems Interconnect (OSI) model offer an alternative to Netview and Netview PC?
- How do users view AT&T's Universal Network Management Architecture (UNMA)?
- How many third-party network management companies exist and what kind of products do they offer?
- How much network management capability is built into the various long-haul carrier services?
- How can you cost justify network managment purchases?
- What's the difference between performance measurement and diagnostics?
- What is the Network Management Forum?

● Purpose

The purpose of this seminar is to familiarize participants with both basic and advanced elements of network management hardware, software and services. It is further the purpose to show, through actual user experiences, how network management tools can create more cost efficient networks.

Network management for both large and small networks will be addressed. The role of modems in multi-drop networks will be discussed along with the network management capabilities of T-1 multiplexers.

Products and services from both large and small vendors will also be discussed, as the panel attempts to cover the widest possible spectrum of offerings.

Issues of interest will vary widely. This seminar will be of equal value to data oriented computer system departments and voice oriented telecommunications departments.

Dan Richards

Dan Richards is IBM's manager of network management products, including Netview and Netview PC. Since starting at IBM in 1959, he has held a variety of positions, including senior system engineer, network control products development and test manager and network control products product manager.

Howard Frank

Howard Frank is chairman of Network Management, Inc. Past president and CEO of Contel Information Systems, he has served as visiting consultant in charge of network analysis for the Executive Office of the President of the United States.

David Edison

David Edison is executive vice president of Corporate Information and Communications Systems, Westinghouse Electric Corp. He has responsibility for planning and operating the corporate telecommunications network, a $60 million enterprise. He started at Westinghouse in 1963.

James Herman

James Herman is president of Future Network Consulting. In over 14 years of computer and communication system experience, he has managed some of the world's most complex networks, including the ARPANET, the Defense Data Network and the DARPA internet.

William Gilbert

William Gilbert is responsible for planning AT&T's integrated Network Management program. He works closely with Universal Network Management Architecture and the Network Management Protocol, AT&T's Open Systems Interconnect network management protocols.

Peter Hicks

Peter Hicks is senior director, Network Design, Planning and Implementation with Sears Communications Network, Inc. He has 18 years of experience in the telecommunications industry. He was manager of Network Systems for Standard Oil of Indiana from 1980 to 1985.

Syllabus

IBM

- IBM Strengths and Weaknesses of Netview and Netview PC
- Network Management for OS/2 Users Netview versus OSI Network Management
- Netview versus AT&T and DEC Network Management within SAA Alliance with PacTel Spectrum

Digital Equipment Corporation

- Enterprise Management Architecture (EMA)
- EMA Compatibility with OSI Configuration Management Information Protocol (CMIP)
- Third Party Vendors under EMA Umbrella

AT&T

- Strengths and Weaknesses of UNMA
- Monitoring 400 PBXs Simultaneously with Accumaster

Hewlett Packard

- OpenView

Modem-Based Network Management

- The Necessity to Differentiate Commodity Products
- Proprietary versus Open Systems
  - Racal Milgo Codex
  - Atlantic Research
  - AT&T Case Digilog
  - Dynatech Infinet Paradyne
  - General DataComm

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Worth Noting

"The ultimate hope for LAN users is that their departments will see text, data, voice and image all handled along the same common channel — a monumental but achievable target for LAN vendors in the next few years."

Allan Duffy
Research manager — communications
European Technology Services Group
International Data Corp.
Framingham, Mass.

Netnotes

Robbins Communications, Inc. will install local networks at United Parcel Service, Inc.'s (UPS) Air Hub at Philadelphia International Airport.

The $250,000 project includes installation of a 350-node fiber-optic local network and a 100-node token-ring network.

In addition, Robbins Communications will install cabling and station wiring for a private branch exchange and 600 telephones.

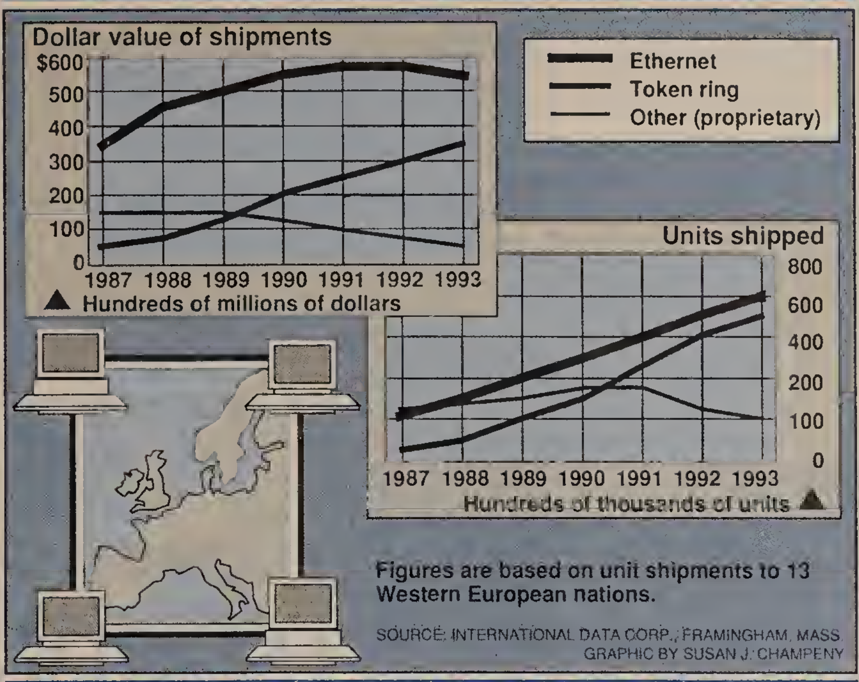
According to Joe Hieronimus, vice-president and chief operating officer of Robbins Communications, the networks are expected to be installed and running by March 1. UPS will use the networks to track incoming and outgoing parcels as well as flight information.

The **IEEE 802 Committee** recently spun off a new subcommittee — the 802.10 working group — that will formulate a local network security standard.

The local network vendors on the committee decided to form the subcommittee because of common concerns about the incompatibility of local network-based encryption products.

The committee members plan to develop a standard security protocol that will ensure interoperability of network products. ◼

The Western European LAN surge



Figures are based on unit shipments to 13 Western European nations.

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.
GRAPHIC BY SUSAN J. CHAMPENY

Banyan's E-mail gateway ties Apple Macs, IBM PCs

Mac users gain WAN functions of VINES server.

By Laura DiDio
Senior Editor

WESTBOROUGH, Mass. — Banyan Systems, Inc. recently introduced its first product for the Apple Computer, Inc. market: a gateway that lets Apple Macintoshes and IBM Personal Computers exchange electronic mail across a Banyan VINES network.

The VINES Mac Mail Gateway enables users of Macintoshes and MS-DOS-based personal computers to transfer E-mail and file attachments.

The gateway works with Banyan's VINES-based Network Mail program and QuickMail, a Macintosh mail program developed and marketed by CE Software of Des Moines, Iowa. Macintoshes are linked to the VINES server through an Ethernet bridge or an Ethernet-to-LocalTalk network bridge, such as Kinetics, Inc.'s FastPath product.

> The listener and the bridge communicate using the AppleTalk protocol.
>
> ▲▲▲

The gateway also allows Macintosh users to employ the wide-area network capabilities of the VINES server.

Prior to the introduction of the gateway, VINES networks could only accommodate the exchange of E-mail between attached personal computers, according to a Banyan spokesman.

The spokesman said the announcement of the E-mail link is the first step in a four-phase evolution to full Macintosh integration. In the future, Banyan will provide support for such capabilities as file and print sharing.

Banyan chose QuickMail because it is the only Macintosh mail package that currently supports mail gateways, according to Mary Kirson, Banyan's director of product marketing.

Kirson said the gateway handles format conversions to allow exchange of file attachments between Macintoshes and Personal Computers.

The VINES Mac Mail Gateway consists of two software components: the listener and the bridge. The listener portion of the gateway runs on a VINES/80386 or 80386-based Corporate Network Server (CNS) as an application under the VINES network operating system. The bridge portion runs with the QuickMail Administrator program on a nondedicated Macintosh. The Macintosh needs at least 2M bytes of random-access memory.

The listener and the bridge communicate using the AppleTalk protocol, which is supported by Banyan servers. According to Kirson, users do not need to know where the Mac Mail Gateway is located in order to use it. "Both mail systems allow the network administrator to assign the gateway a name in order to remotely manage the application," she said.

Because the listener portion of the gateway is an application of the VINES operating system, Macintosh users can take advantage of the wide-area networking capabilities of the VINES server. For instance, Kirson said, a com-

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New bridge offers 8 links to remote nets

CrossComm ILAN bridge increases LAN links, provides fault tolerance and net management.

By Laura DiDio
Senior Editor

MARLBOROUGH, Mass. — CrossComm Corp. recently introduced a new version of its ILAN bridge that supports up to eight leased-line links between local networks at speeds ranging from 19.2K bit/sec to T-1.

The initial ILAN bridge offering only supported one link between remote local nets, said Tad Witkowicz, CrossComm president and founder.

The newly unveiled ILAN, a combination hardware and software product, includes an enhanced version of the company's bridging software, dubbed Version 2.0 IMS-1 software.

It also supports a Parallel Link feature that provides fault tolerance and network management capabilities.

The Parallel Link feature lets network managers program an ILAN bridge to use up to eight T-1 channels or any combination of T-1, 56K bit/sec or 19.2K bit/sec leased lines to link local networks. ILAN can be used to bridge Ethernet and Starlan local nets.

The hardware portion of the new ILAN bridge is a controller that works in conjunction with the IMS-1 Version 2.0 software. The controller provides the framing capability that enables an ILAN bridge to support up to eight parallel links with a remote ILAN bridge.

IMS-1 Version 2.0 runs as an application under MS-DOS on any IBM Personal Computer or compatible on the network. The controller is a separate device linked to the local net.

Easy network management

"With our configuration, there is no need for the user to buy a dedicated network management station," Witkowicz said. "Through the IMS-1 software, the user can manage any ILAN bridge, regardless of its geographic location."

For example, he said, a network manager can check the sta-

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Sytek bridge links fiber backbone to Ethernets

By Paul Desmond
Staff Writer

MOUNTAIN VIEW, Calif. — Sytek, Inc. recently announced a protocol-transparent bridge for linking multiple Ethernet local networks to an IEEE 802.4 token-bus fiber-optic cable backbone.

Sytek also introduced a high-speed Ethernet bridge and an X.25 interface for its LocalNet local networks.

The 8220 Fiber Optic Backbone Bridge is a combination hardware/software product that operates at the media access control (MAC) layer and encapsulates 802.3 Ethernet packets so they appear as 802.4 token-bus packets.

Because it is an MAC-layer bridge, the 8220 does not perform protocol conversions and can support any Ethernet-compatible protocol, including Digital Equipment Corp.'s DECnet, Transmission Control Protocol/Internet Protocol, Novell, Inc.'s NetWare and Xerox Corp.'s Xerox Network Systems. Thus, devices from different vendors using different protocols can share the same backbone.

The product can be used with a four- or eight-port passive star node. With the four-port node, it supports segment lengths of 1,000 meters; with the eight-port node, it supports lengths of 500 meters.

To increase those distances, the 8220 can be used with active star nodes linked to support dozens of subnets spanning up to 12 miles.

The 8220 supports both standard and thin-wire Ethernet subnetworks.

Sytek described the 8220 as "a self-learning bridge" that automatically acquires and stores network configuration data, tracks changes and stores up to 3,000 Ethernet addresses. Up to 800 addresses can be stored in permanent, nonvolatile memory that can survive a power outage.

The bridge purges idle addresses to increase performance, and it monitors all packets on its subnetwork but routes only packets destined for remote nets. The 8220 filters packets at 8,000 packet/sec, and its throughput is 5,000 packet/sec.

The 8220 supports multimode duplex 62.5/125 micron fiber ca-

(continued on page 20)

"He was about to spend millions on a system that could become obsolete tomorrow.
Ulcer material.
I gave him some insurance."

–Carol McLarty, AT&T Branch Manager

"He was redesigning the company's information network. Mainframes and business computers, phone systems, data communications equipment, the whole shebang. And he was justifiably concerned.

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But, most important, AT&T's open-ended solutions help protect your investment, which will enable you to add new equipment as new technologies are developed, without scrapping all the equipment you already have.

Partnering with us now can provide you systems with the future built in. That's the best insurance anyone could have."

For more information about AT&T's open-ended solutions, contact your AT&T Account Executive or call 1 800 247-1212.

AT&T

The right choice.

Bridge links fiber backbone, Ethernets

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ble, which is the same fiber specified by the emerging Fiber Distributed Data Interface standard, Sytek said.

WAN bridge bows

In a related announcement, Sytek introduced a wide-area network bridge for connecting remote Ethernets via high-speed links such as T-1.

The 8011 WAN Bridge is a protocol-transparent, MAC-layer bridge that supports data transmission speeds up to 2.084M bit/sec (European T-1) in point-to-point applications.

Like the 8220, the 8011 supports both standard and thin-wire Ethernet. In addition, it can filter packets based on protocol, source or destination, allowing users to isolate certain packets to specific nets.

Sytek also unveiled an X.25 gateway for users of its Sytek LocalNet local networks.

The 8125 LocalNet/X.25 Gateway provides an X.25 interface between LocalNet networks and public data networks. It provides automatic session setup and routing, network management features and self-diagnostic capabilities. The gateway handles up to 32 sessions simultaneously at link speeds up to 64K bit/sec.

Sytek's 8220 Fiber Optic Backbone Bridge will be available in February for $9,995. The 8011 WAN Bridge will also be available in February and will cost $7,500. The 8125 LocalNet/X.25 Gateway will ship in January and is priced at $12,000.

Sytek can be reached at 1225 Charleston Road, Mountain View, Calif. 94043, or call (415) 966-7300. ◘

New bridge offers 8 links to remote nets

continued from page 17

tus of remote ILAN bridges by typing in the appropriate commands at the Personal Computer.

Users can attach multiple Ethernets or Starlans to a local ILAN bridge. Lines can be added, removed or modified at any time, Witkowicz said. The network manager works with the IMS-1 Version 2.0 software to tailor the link capacity to the user's specific requirements.

According to Witkowicz, the ILAN bridge is targeted at large corporate and government local network users that need to interconnect multiple local nets.

Another feature of the new ILAN bridge is fault tolerance or a hot standby for the main telecommunications link, Witkowicz said.

"This means that the user who already has a T-1 line can add a 56K bit/sec line, which will provide him with a backup in case the T-1 line fails," Witkowicz said. "At the same time, because of the special features of the Parallel Link software, he can use the 56K [bit/sec] line for additional network traffic."

Also, the ILAN bridge allows the network manager to route different classes of traffic to the different links.

"For instance, T-1 lines may be reserved for high-priority network traffic such as host-to-host communications, and the other lines can be be used for more general-purpose network traffic."

ILAN is available now. According to Witkowicz, early users of the new CrossComm bridge include IBM and Schlumberger Ltd.

> The ILAN is targeted at large corporate and government local net users that need to interconnect multiple local nets.

▲▲▲

The ILAN module consists of either a T-1 communications controller card or a 56K bit/sec controller card, plus the IMS-1 Version 2.0 software. The Version 2.0 software is priced at $2,995. Those users wishing to add telecommunications lines will receive the software upgrade free of charge. The cost of additional controller cards is $1,500 for each 56K bit/sec module and $3,750 for each T-1 module.

For more information, contact CrossComm at 133 E. Main St., Marlborough, Mass. 01752, or call (508) 481-4060. ◘

Banyan gateway ties Apple Macs, IBM PCs

continued from page 17

pany would be able to use the gateway to link a remote Macintosh network to the VINES network via X.25.

Utilizing the new VINES Mac Mail Gateway, Macintoshes can also access gateways to other mail systems, such as the Soft-Switch, Inc. Soft-Switch Central, which provides connectivity to IBM's Professional Office System or Digital Equipment Corp.'s All-In-1 E-mail packages.

The VINES Mac Mail Gateway is the result of a joint development effort between Banyan and StarNine Technologies, Inc., a 1-year-old start-up in Berkeley, Calif., that specializes in E-mail packages. The gateway is built on StarNine's Mail*Link software offering, which transfers mail between Macintoshes and the Unix environment.

The VINES Mac Mail Gateway will be available in April. "We chose April," Kirson said, "because the gateway will require the next release of VINES, Release 3.1, which will ship by April." VINES Version 3.1 will have built-in support for the AppleTalk protocol.

The Mac Mail Gateway has a list price of $795 per server. It requires either a VINES/80386 or an 80386-based CNS server. It will also work in conjunction with the Banyan Network Server, the Desktop Server and VINES/80286 servers. ◘

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MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

Worth Noting

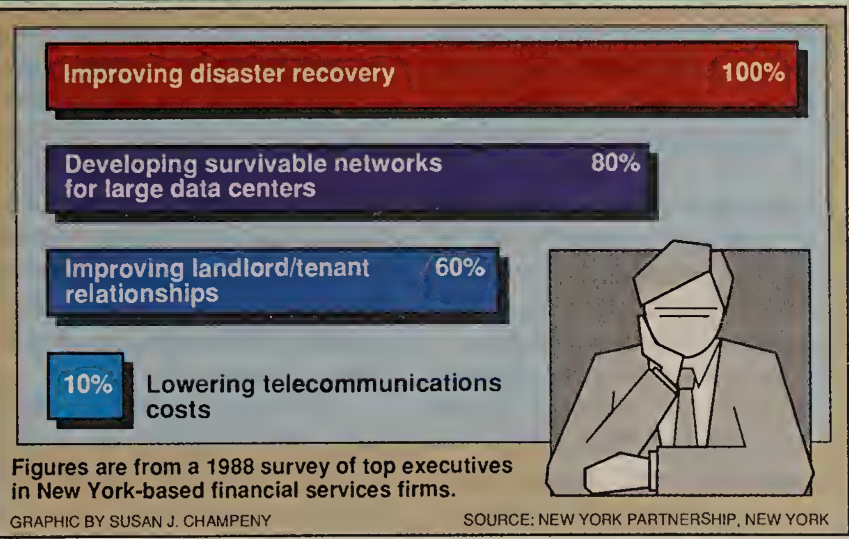
Nearly 80% of the respondents to a survey of 300 sites using Transmission Control Protocol/Internet Protocol said they plan to migrate to Open Systems Interconnection. Ten percent said they have no plans to migrate to OSI, while the remainder said they did not know if they would migrate. The survey was conducted by Santa Clara, Calif.-based consulting firm Infonetics, Inc.

Association Watch

The **National Automated Clearing House Association (NACHA)** recently elected David Kvederis chairman of the board. He will serve a two-year term beginning in May. Kvederis is a senior vice-president of the cash management division at Wells Fargo Bank, N.A. in San Francisco. He is also chairman of NACHA's marketing committee and a member of its executive committee. NACHA is a national trade association that represents and oversees 42 automated clearinghouse associations in the U.S.

The **North American Telecommunications Association (NATA)** has developed a set of six instructional audio cassettes for sale to members. The package — the first in a series of training tapes — contains cassettes covering the history of key systems, carrier transmission services, private branch exchanges and central branch exchanges, and the telecommunications industry. The six-cassette package costs $250 and includes a portable cassette player. Future packages will be available for $99. For more information, call (800) 538-6282.

Users' biggest networking concerns



Figures are from a 1988 survey of top executives in New York-based financial services firms.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: NEW YORK PARTNERSHIP, NEW YORK

Big firms help pave way for CIM study in colleges

Shortage of engineers prompts corporate effort.

By Wayne Eckerson
Staff Writer

With help from IBM and other major manufacturers, U.S. colleges and universities are beginning to beef up their course offerings in computer-integrated manufacturing (CIM).

U.S. companies are looking to CIM to improve operations and enhance their competitiveness in the world market. Toward that end, they are pushing colleges to expand CIM programs to help ease the shortage of trained engineers and technical support staffers (see "Deere profits from CIM know-how," page 22). Corporations are donating money, equipment and personnel to aid schools in developing curricula and setting up laboratories devoted to CIM.

In CIM, all aspects of the manufacturing process — from office applications to factory floor operations — are linked through networking. By improving the flow of information between departments, CIM gives users greater flexibility to shift production operations to meet new opportunities. It also helps them make more efficient use of materials and personnel.

IBM chips in

Two weeks ago, IBM announced that it will spend roughly $25 million to help 48 colleges and universities train students in CIM. This is the second time in six years that IBM has made a multimillion-dollar contribution to U.S. schools for development of educational programs geared to computerized manufacturing.

"IBM put a big carrot out there and awakened the audience," said Marvin DeVries, director of the Manufacturing Systems Engineering Program at the University of Wisconsin at Madison.

IBM will provide selected schools with $500,000 worth of hardware and software, as well as technical support and advice. In exchange, the schools will develop CIM curricula and demonstration projects for the local industry, IBM staff and customers.

In 1982, IBM donated some $50 million to 22 schools. That, DeVries said, focused attention on industry needs and had a ripple effect on university engineering programs. About 40 schools that applied for but did not receive grants from IBM sought funding from other firms to develop their CIM programs.

Today, six universities offer accredited master's degree programs in manufacturing that have a CIM emphasis, and there are 31 accredited programs at two- and four-year schools. This is double the number that existed 10 years ago, according to Mark Stratton, manager of manufacturing education at the Society of Manufacturing Engineers (SME). SME is a 70,000-member organization that sponsors seminars and conferences and supports numerous associations to advance manufacturing knowledge in the U.S.

Despite the progress, universities are the first to admit they have a long way to go to meet industry needs. "Computer-integrated manufacturing is changing so rapidly that it is difficult for academia to respond. We are behind but making progress," DeVries said.

Foreign competition

U.S. manufacturers will need a flock of well-trained CIM specialists to remain competitive with foreign companies that are pushing hard on the CIM front.

West Germany, in particular, has a wide array of cooperative ventures between industry and education, according to Stratton.

Japan is close behind West Germany and the U.S. Japan has

(continued on page 22)

Decentralized firms face standards fight

The trend toward departmental purchasing makes migration to open standards difficult.

By Barton Crockett
Senior Writer

While decentralization is very much in vogue in U.S. industry, a decentralized approach to communications management makes it difficult for a company to adopt standards such as Open Systems Interconnection.

In a decentralized company, business units are free to manage operations as they see fit. They buy computer and communications equipment according to individual needs rather than follow strict corporate guidelines. The result is that network managers in such companies often have little power to enforce migration to open standards.

Government woes

Even network managers in the federal government, which is committed to OSI, say they find it difficult to enforce standards compliance among a diverse group of end users.

"I service a lot of scientists and, historically, they've had a great deal of freedom to buy whatever computers they wanted," said Eliot Christian, deputy chief of the U.S. Geological Survey's office of systems management in Reston, Va. "It's hard for me to tell them that they can only buy OSI-compliant hardware."

With their authority limited, communications managers in decentralized companies are often forced to act like net salespeople, peddling open systems to a sometimes unreceptive clientele.

"It's my job to sell individual departments in my agency on OSI," said Kenneth Lini, a communications manager with the U.S. Department of Agriculture (USDA) in Fort Collins, Colo. "Until OSI is mandated in government purchases [which will happen as part of the Government OSI Profile guidelines in 1989] I face an uphill battle, trying to convince departments that aren't really sure of [OSI's] benefits."

Undoubtedly, it helps to have upper management's support.

"From my perspective, OSI has to be a top-down initiative,"

(continued on page 22)

EXECUTIVE BRIEFS

BY BARTON CROCKETT

Spy networks. An increasing number of companies are snooping on their competitors.

So concludes a recent report by The Conference Board, a New York-based management research group, which dubs the practice "competitive intelligence." While the report's authors say there is no way to measure the extent of competitive intelligence, they do write that "there's no question that interest in it has increased over the last few years."

The report defines competitive intelligence as any activity whereby a company systematically seeks out and analyzes information on its competitors. While such information can be culled through subterfuge, the authors point out that most competitive intelligence techniques are legal.

For instance, one unnamed company interviewed employees from a competitor for a fictitious job opening in order to ask them for detailed information about marketing strategies at the rival firm. Another executive received a complimentary tour of a competitor's factory simply by asking for one. He said he worked at a company other than his own, the name of which his competitors would have recognized.

Two companies profiled in the report have developed competitive intelligence networks. AT&T runs a network with information on 1,400 products and 580 companies. Workers in AT&T business units enter information about competitors into the network, where it is compiled in a data base.

This information can then be accessed for decision-making or to research a particular subject.

Motorola, Inc. maintains a similar network with 5,000 terminals worldwide. Jan Herring, director of corporate analytical research with the company, described the network as a tool "to create an [information] sharing culture in the company."

Firms pave way for CIM study

continued from page 21

excelled at automating the factory floor but has done little with advanced planning and the use of manufacturing resource planning systems, according to William McSpadden, chief executive officer of Plant-wide Research Corp., a Billerica, Mass.-based market research firm specializing in systems manufacturing.

These systems coordinate all resources of a manufacturing operation — from manpower and money to machines and materials — and are the cornerstone of a good CIM strategy, McSpadden said.

CIM roadblocks

U.S. universities will have to overcome a number of obstacles if they are to provide U.S. companies with future employees. For one, universities have a difficult time attracting and keeping qualified faculty members. Good candidates are often lured away by the big salaries offered in the private sector.

To help solve that problem, businesses often donate personnel who serve as faculty members on an ad hoc basis. Several corporations have established faculty chairs for systems and manufacturing education.

Getting the necessary equipment to train students is another problem. Advanced manufacturing equipment is prohibitively expensive and needs upgrades frequently, leaving universities in the lurch unless industry is willing to donate it.

In addition, U.S. engineering programs tend to focus on theory and research instead of practical applications. William Sprague, a staff project engineer in the advanced engineering department of General Motors Corp., said he thinks the Soviet launching of the Sputnik satellite in 1957 changed the focus of engineering programs from vocational training to scientific principles and basic research. He said it is time the pendulum of change began swinging the other way.

Waiting for the benefits

While companies with deep pockets, such as IBM, have helped address these problems, the benefits of their deeds have not trickled down to the majority of colleges or manufacturing firms.

"I can't get college graduates who fully understand computerized manufacturing, let alone integrated manufacturing," said Daniel Miklovic, program manager for manufacturing systems planning at Weyerhaeuser Information Systems in Tacoma, Wash.

Miklovic said he works closely with a local college that has a specialized program to give students the fundamental skills they need to work at Weyerhaeuser.

Cooperation between a company and a local college is typical among CIM users. Often firms will offer to support or sponsor CIM-related businesses or technical courses at a local school and then enroll employees who need to acquire additional skills.

A company such as GM, with its headquarters in Detroit, has had a major impact on the number of CIM-specific programs in local schools.

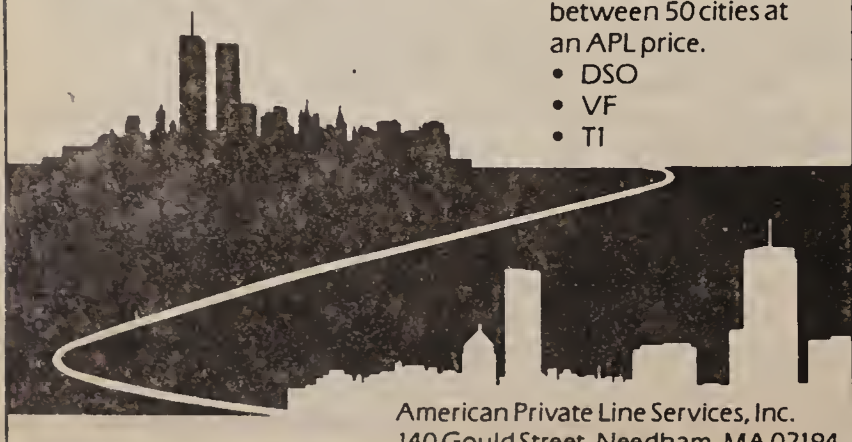
"We're seeing the universities here in Michigan respond to the needs of the automotive industry," said Dan Kosmalski, manager of CIM at Merit Systems, Inc., a large provider of data processing services, including CIM.

Kosmalski said groups such as the Industrial Technology Institute (ITI), a research center in Ann Arbor, Mich., have helped local universities and junior and technical colleges keep in tune with the needs of manufacturing. ITI employs more than 150 consultants — most from the ranks of industry — that specialize in a cross section of CIM processes, such as digital communications, systems integration, tool development and management issues.

But outside Michigan, Kosmalski said he has found few schools whose programs give students the skills they need to succeed in a CIM shop.

It is clear that U.S. industry will need greater help from higher education to remain competitive in CIM.

According to DeVries, "It's going to be critical in the next decade for the industry to continue to tell universities that it wants students trained in computer-integrated manufacturing." ▣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Deere profits from CIM know-how

The shortage of workers with training or experience in computer-integrated manufacturing (CIM) has many users — especially smaller firms — scrambling to learn the technology.

Three years ago, Deere & Co. of Moline, Ill., decided to take advantage of that situation. The farm equipment maker and early CIM user started a consulting service that helps users seeking to launch CIM operations.

Deere's consulting business, called Deere Technical Services, Inc., employs about 100 consultants who have a range of engineering and computer expertise. When necessary, the business can also draw upon the resources of its parent company.

Bruce Gengler, a project manager and consultant for Deere Technical Services, said companies began calling on Deere after it became the first winner of the prestigious LEAD award from the Computer and Automated Systems Association of the Society of Manufacturing Engineers in 1981 (see "SME awards CIM leadership in colleges," this page).

"We were spending so much time giving tours of our facility and explaining how we got into CIM that we decided to spin off a consulting service," Gengler said. Since then, Deere Technical Services has grown tremendously. Many of its clients are large automotive and aircraft manufacturing companies. "The buzzword of CIM has been around long enough, but most people don't know how to get started or don't have the required experience," he said.

Ironically, Deere's expertise in CIM came not through formal training but from a willingness to experiment with the technology. "We started bringing in computers, setting up nets and found out what works and what doesn't," Gengler said.

— *Wayne Eckerson*

Firms face standards fight

continued from page 21

said Jerry McCracken, manager of manufacturing operations at San Francisco-based Bechtel National, Inc., which makes factories. "Without backing from upper management, even centralized organizations will have difficulty implementing the standard."

GM's MAP Laboratory

While General Motors Corp. has invested millions of dollars in developing Manufacturing Automation Protocol systems, it still gives its factory managers a good deal of freedom in purchasing communications equipment.

This is part of a larger corporate philosophy that calls for plant managers to operate their factories like minibusinesses with profit and loss responsibility.

So rather than order its factory managers to use MAP, GM persuades them. The company sends hundreds of managers to its technical center in Warren, Mich., to learn about MAP and to hear vendor presentations and testimonials from MAP users. The automaker operates a MAP interoperability laboratory that factory managers can use to test new MAP equipment ("MAP research center puts GM on road to the future," *NW*, July 18).

The result, according to Michael Kaminski, who heads up GM's MAP group, is that 32 of the company's 160 factories worldwide now use some form of MAP net. Of all new networking equipment installed in GM factories, he said, 75% is MAP equipment.

For the most part, Hughes Aircraft Co., based in El Segundo, Calif., is committed to decentralization. Consequently, individual departments manage their own operations and have wide latitude in buying computer and communications equipment.

But last year, top managers at the firm approved new corporate guidelines requiring end-user departments to buy equipment that conforms to OSI standards wherever possible. Only if a department can demonstrate that it cannot find reasonably priced OSI-compliant products is it allowed to buy equipment based on proprietary standards. Hughes' managers sign and abide by the document like a contract.

Bud Huber, manager of advanced networking integration with Hughes' communications and data processing division in Long Beach, Calif., helped write the guidelines. He said they are essential for raising end-user awareness about OSI and getting a formal commitment from them to use the standard.

USDA approach

The USDA's Lini, however, has decided to forgo such aids and convince his division managers to use OSI based only on the merits of the standard.

Lini has devised an OSI-based networking system that he said can save a division nearly 25% on data communications costs ("Users brainstorm on OSI migration," *NW*, Dec. 5).

"What I do is go up to department managers and simply show them how much money they can save with OSI," he said. "When I do this, they're much more receptive to using the standard." ▣

SME awards CIM leadership in colleges

Since 1985, the Computer and Automated Systems Association (CASA) of the Society of Manufacturing Engineers has honored universities with its Leadership and Excellence in Application and Development (LEAD) Award for efforts in the advancement of computer-integrated manufacturing (CIM).

Each year, the award is presented to a university for its achievements in developing a CIM curriculum and laboratory facilities, and for sharing knowledge and experience with the industry and other universities.

The four university winners to date are: Lehigh University in Bethlehem, Pa. (1985), Georgia Institute of Technology in Atlanta (1986), Rensselaer Polytechnic Institute in Troy, N.Y. (1987), and the University of Wisconsin at Madison (1988).

U.S. businesses played a significant role in shaping the CIM programs of these award-winning schools.

In 1982, each school received a $4 million grant from IBM. Two million dollars were earmarked for CIM curriculum enhancement, and the remaining grant funding came in the form of hardware and software to support CIM research.

This year's LEAD award winner, the University of Wisconsin at Madison, was honored for establishing a master's level Manufacturing Systems Engineering degree program that provides students with a balance of technical and managerial training for working in CIM environments.

The CASA has also bestowed LEAD awards on CIM users each year since 1981. The companies that have received the award are:

Deere & Co. of Moline, Ill. (1981), Ingersoll Milling Machine Co. in Rockford, Ill. (1982), AT&T Technologies, Inc.'s Printed Wiring Board facility in Richmond, Va., (1983), General Electric Co.'s Steam Turbine-Generator operations in Schenectady, N.Y. (1984), Cone Drive division of Textron, Inc. in Traverse City, Mich. (1985), Martin Marietta Energy Systems, Inc.'s Y-12 plant in Oak Ridge, Tenn. (1986), Texas Instruments, Inc.'s Defense Systems and Electronics Group in Sherman, Texas (1987) and Allen-Bradley Co. in Milwaukee (1988).

— *Wayne Eckerson*

PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

Worth Noting

See inside for:

- Raycom Systems' fiber device for IBM's 16M bit/sec Token-Ring
- Four new modem boards for Toshiba lap-tops
- Interlan software for NetWare, OS/2 LAN Manager interoperability

First Look

Apple Macs, IBM PCs linked to IBM AS/400

KMW Systems Corp. recently enhanced its protocol converters and released software that enables Apple Computer, Inc. Macintoshes and IBM Personal Computers to communicate and transfer files with IBM Application System/400 (AS/400) minicomputers.

KMW's **Series II Twinax** and **Series III Twinax** protocol converters enable a Macintosh or IBM Personal Computer to emulate an IBM 5251 or 5291 terminal when linked to an IBM AS/400, System/36 or System/38 minicomputer. Previously, the products provided this capability only when the Macintosh or Personal Computer was linked to an IBM System/36 or System/38.

In addition, the Series II and Series III Twinax enable a mix of asynchronous terminals and peripherals to link to an AS/400, System/36 or System/38.

Many printers are also supported, including the Hewlett-Packard Co. LaserJet and Apple's ImageWriter or LaserWriter. Those printers appear to the AS/400 as various models of IBM printers.

The protocol converters come bundled with file-transfer software for either the Macintosh or the Personal Computer. KMW developed the Macintosh software in conjunction with Apple. That software runs on the Macintosh and lets the Macintosh transfer files with AS/400s running Emerald Technology Group, Inc.'s Emulation Transfer Utility (ETU) software.

(continued on page 24)

SDM links new ATMs to old nets

NASHVILLE — Software Development and Maintenance International, Inc. (SDM) is expected to unveil this week software that links advanced automated teller machines to existing ATM networks.

At the Retail Delivery Systems Conference, which gets underway here today, SDM will announce OCM24/Device Management Facility (DMF). The software lets ATM network operators integrate recently released advanced ATMs into their networks without having to rewrite transaction-processing software. Modern, advanced ATMs generally support a number of transactions older ATMs do not.

Advanced ATMs, such as IBM's 473X Personal Banking Machine (PBM), support check-cashing functions that let a bank's ATM customers deposit part of a check in an account and get the remainder in cash.

Advanced ATMs also let customers split a deposit between multiple accounts. Previously, deposits made at ATMs had to be credited to one account. Newer ATMs also enable customers to obtain ministatements that detail the customers' most recent transactions.

OCM24/DMF runs on an IBM mainframe under CICS and MVS/VSE.

In addition to ATMs, the software is designed to control point-of-sale devices such as card-authorization terminals. It can work with existing card-authorization software running on the same IBM host.

To use the OCM24/DMF, systems personnel build a Transaction Control File that is loaded into OCM24/DMF. This file supports the transaction formats needed by the newer ATMs. OCM24/DMF documentation helps systems personnel build the translation tables needed to convert the ATM or POS device transaction format to the format used by existing authorization software. This enables users to preserve existing cardholder and authorization data bases.

The initial OCM24/DMF release will support IBM's 473X PBM. Subsequent releases will support NCR Corp. and Diebold, Inc. ATM and POS devices.

Currently available, OCM24/DMF ranges in price from $55,000 to $70,000.

SDM can be contacted at 134 Spring Ave., P.O. Box 668, Fuquay-Varina, N.C. 27526, or call (919) 552-5662.

Sykes Datatronics unveils telemanagement software

By Jim Brown
New Products Editor

ROCHESTER, N.Y. — Sykes Datatronics, Inc. recently unveiled microcomputer-based telemanagement software that enables users to track inventory, monitor telephone usage and analyze long-haul carrier services.

Sykes Datatronics' Comm-Net 2000 software runs on multiuser Unix- or Xenix-based microcomputers capable of supporting asynchronous terminals. The package includes a Concurrent Computer Corp. Unify relational data base management system. In addition, Comm-Net 2000 includes six new application modules and works with two existing Sykes Datatronics telemanagement applications.

The six new application modules include:

- An Equipment Management module that lets users track telephone equipment inventory, as well as generate and track equipment purchase orders.
- A Directory Management module that can be used to maintain a companywide telephone directory and department directories.
- A Long Distance Optimization Management module that helps users cut costs by comparing services from multiple carriers. Users can compare as many as nine services from five carriers. The module can also be used to determine the number of circuits needed to support call volume.
- A Trouble Tracking module that enables users to create a data base highlighting past or current equipment or service problems. That data base defines an equipment or service problem, what was done to repair it and when the repair was made.
- A Traffic Management module that enables users to analyze line and trunk utilization, as well as call traffic patterns.
- A Cable Management module, which enables users to track telephone cable installations and inventory.

The two existing applications Comm-Net 2000 works with are:

- Comm-Traks 1000 software, which provides a call management function. This software enables a microcomputer directly connected to a private branch exchange maintenance port to collect station message detail re-

(continued on page 24)

SynOptics offers net mgmt. for LattisNet

System provides management of concentrators in Ethernet-over-twisted-pair and fiber networks.

By Jim Brown
New Products Editor

MOUNTAIN VIEW, Calif. — SynOptics Communications, Inc. last week introduced a system that enables users to manage a network of its LattisNet concentrators, which support 10M bit/sec Ethernets over twisted-pair wire or fiber-optic cable.

The LattisNet Network Management system features a Control Console, which is an IBM Personal Computer AT running SynOptics-developed software that uses Microsoft Corp.'s Windows software. The Control Console is outfitted with a LattisNet adapter board and works in conjunction with a Network Management Module board that resides in each LattisNet concentrator.

The Control Console enables network operators to collect network management data from LattisNet concentrators, which are stand-alone units with up to eight board slots. These slots support port boards, each of which provides ports for eight Ethernet devices. The Network Management Module requires a concentrator board slot, thus limiting the concentrator to a maximum of seven port boards and 56 ports.

Configured in a hierarchical star topology, concentrators support physical-link and data-link connections between devices via a 10M bit/sec Ethernet backbone.

The LattisNet Network Management system enables a network operator to isolate problems such as broken network cables and faulty concentrator port boards. It also collects LattisNet usage statistics and maintains a configuration data base.

> The system enables a net operator to isolate problems such as broken network cables.
>
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The Control Console screen displays a map of the LattisNet network. Concentrators added to the network after the data base has been created automatically transmit a message to the Control Console. The configuration data base is automatically updated, and an icon representing that concentrator is added to the screen display. The data base also maintains information on the traffic level of each concentrator.

The Control Console can collect information at predefined intervals. Additionally, users can set threshold parameters for each concentrator port. When that threshold is exceeded, the Network Management Module will send an alarm message to the Control Console, which will display the alarm in real-time.

> The system's Control Console screen displays a map of the LattisNet network.
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SynOptics also provides a LattisNet adapter board with a built-in 1,200 bit/sec modem. This modem will establish a dial-up link to concentrators when the LattisNet network is down.

SynOptics' Model 630 Control Console package includes a LattisNet adapter board as well as Microsoft Windows. The Model 631 Control Console supports the LattisNet adapter with a built-in modem. The Model 630 Control Console package is priced at $4,000, while the Model 631 Control Console package costs $4,500.

The company's Model 212 Network Management Module features a standard attachment unit interface that links the concentrator to a twisted-pair wire Ethernet. The Model 217 Network Management Module connects the concentrator to a fiber-optic cable Ethernet. Both the Model 212 and Model 217 Network Management Modules also replace LattisNet concentrator-resident termination and retiming modules.

Current LattisNet users trading in termination and retiming modules can purchase Model 212 or Model 217 Network Management Modules for $2,000 each. The price of Model 213 and Model 218 Network Management Modules, which support a built-in 1,200 bit/sec modem, is $2,450.

SynOptics can be reached by writing to 501 E. Middlefield Road, Mountain View, Calif. 94043, or by calling (415) 960-1100.

Teleconnect unveils Challenger digital hybrid telephone systems

By Jim Brown
New Products Editor

CEDAR RAPIDS, Iowa — Teleconnect Telecommunications Systems Co. recently introduced a pair of digital hybrid telephone systems, the Challenger System CM and the Challenger System CL.

Both units use the same trunk and telephone port boards, each of which supports four ports. The 32-port Challenger System CM can be configured to support up to 16 central-office trunks and 16 telephones.

> Both systems can store five predefined voice messages.
>
> ▲▲▲

The 88-port Challenger System CL can be configured to support up to 32 trunks and 56 telephones.

Both systems also support a card that stores up to five predefined voice messages digitized at 64K bit/sec using pulse code modulation. These messages inform callers if a party's line is busy or if that party is in a meeting, for example. The company intends to expand the digitized voice capability to support an automated attendant feature next spring.

Both systems support standard 2500-type analog telephones and Teleconnect electronic key telephones. Teleconnect's Standard 24 telephone supports 16 programmable trunk- and feature-access keys as well as eight preprogrammed feature-access keys. The company's Display 24 model offers those features as well as an LCD display.

The Executive 40 supports 16 speed-dial buttons and an LCD display in addition to the same number of keys as the Standard 24. The Executive 48 supports 24 programmable trunk- and feature-access keys, eight preprogrammed keys, 16 speed-dial buttons and an LCD.

The LCD enables users to view a dialed number and call duration display. It also enables internal callers to view a message informing them if an internal extension is busy or if the called party is in a meeting. Both systems also support station message detail recording and an unlimited number of four-digit account codes for call accounting. The Challenger System CL also has a battery backup option that keeps the system running for two hours after a power failure.

The products are sold directly by Teleconnect in Iowa and through authorized Teleconnect Premium Dealers in other parts of the country. Without telephones, the average per-port price for either system ranges from $175 to $375, including installation.

Teleconnect can be reached by writing to 185 50th Ave. S.W., P.O. Box 1408, Cedar Rapids, Iowa 52406, or by calling (800) 397-2537 or (800) 728-7000.

First Look

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KMW will also bundle IBM 5250 Emulation Program software with its protocol converters. Running on an IBM Personal Computer, this software enables Personal Computer users to transfer files with AS/400s running ETU software.

The Series II Twinax is a multiport protocol converter that can link up to seven asynchronous devices to an AS/400. The Series III Twinax is a single-port unit available with either a parallel or serial port.

The Series II Twinax costs from $1,495 to $3,595, depending on the number of ports. The Series III Twinax costs $1,195.

KMW Systems Corp., 6034 W. Courtyard Drive, Austin, Texas 78730, or call (800) 531-5167. In Texas, call (512) 338-3000.

Sykes unveils telemanagement ware

continued from page 23

cording (SMDR) data. The software also enables the microcomputer to poll remote Sykes Datatronics Comm-Stor 500 SMDR collection devices attached to remote telephone switches or Sykes Datatronics Callwatch devices, which collect SMDR information from Centrex service providers.

- Guest Management software that is used by hotels to control the use of guest room telephones. This package also lets PBX owners create service chargeback operations.

Comm-Net 2000 enables the microcomputer to collect SMDR call records in background mode while users process other applications. It also supports 19 predefined report formats. However, users can modify those formats to prepare customized reports.

The Comm-Net 2000 data base costs $4,595, and the Equipment Management application is priced at $10,000. The remaining application modules have an average cost of $4,000 each.

A microcomputer capable of supporting 15M bytes of storage will support roughly 5,000 telephone extensions. An additional 1M byte of storage is required for each 20,000 SMDR call records. A microcomputer with 4M bytes of random-access memory will support up to three users.

Sykes Datatronics will also sell a Unix- or Xenix-based microcomputer as part of a package for between $5,000 and $15,000, depending upon configuration.

Users can write to Sykes Datatronics at 375 Orchard St., Rochester, N.Y. 14606, or call (716) 458-8000.

What do we call an organization that insists on hard network comparisons and live evaluations before buying?

Fiber device for 16M bit/sec Token-Ring Network bows

Raycom Systems, Inc. recently announced a unit that enables microcomputers, bridges and hosts supporting IBM's new 16M bit/sec Token-Ring Network to be linked via fiber-optic cable to a multiple station access unit (MSAU) located up to six miles away.

The **Raycom 3410** also supports this distance for devices attached to other, slower speed IEEE 802.5-compatible token-ring networks. A standard version of the 3410 enables token-ring devices to be located up to 2½ miles from an MSAU, while an extended-distance version allows for distances of up to 6 miles between token-ring devices and MSAUs, such as IBM's Model 8228.

Multiple 3410s can be configured to provide redundancy between MSAUs by routing traffic back to the sending MSAU in the event of a line failure. This technique will prevent a complete network failure.

Available now, the Raycom 3410 costs $1,175 for the standard model and $2,265 for the extended-distance version.

Raycom Systems, Inc., 6395 Gunpark Drive, Boulder, Colo. 80301, or call (800) 288-1620.

Alternate Connections unveils peripheral-sharing unit

Alternate Connections S.A., Inc. recently unveiled a switching device that allows up to eight microcomputers to share a pool of four peripherals.

Matchmaker comes with eight or 12 ports. The eight-port version enables four microcomputers to share four peripherals, while the 12-port version enables eight microcomputers to share four peripherals. Matchmaker is compatible with most microcomputers, including those made by IBM, Apple Computer, Inc. and Compaq Computer Corp. It also works with any peripheral with a serial or parallel port.

Matchmaker has a touch-sensitive pad for line configuration. There is an LED display on each button that displays that line's status. To access a peripheral, users press the button that corresponds to their workstation and the device desired.

Available now, the Matchmaker Model M84, which allows eight microcomputers to share four peripherals, costs $895. The Model M44, which lets four microcomputers share four peripherals, costs $595.

Alternate Connections S.A., Inc. 10 500 Cote de Liesse, #062, Lachine, Quebec, Canada, H8T 1A4, or call (514) 633-9810.

Toshiba introduces four 2,400 bit/sec modems for lap-tops

Toshiba America, Inc. recently announced four 2,400 bit/sec modem boards for its lap-top microcomputers.

The **T2400A** fits in the expansion slot of Toshiba's T1100 Plus, T1200 Series, T1600, T3100, T3100/20, T3100e, T5100 and T5200 lap-tops, while the **T2400B** fits in the expansion slot of the T1000 lap-top. The **T2400C** fits in the built-in modem slot of the T1200 and T1600. The **T2440M** will support the same lap-tops as the T2400A in addition to providing Microcom, Inc.'s Microcom Network Protocol error-checking and data-compression features. Each of the modems is Hayes Microcomputer Products, Inc. AT-compatible.

The T2400A modem is available now. The other three models will ship next year. They range in price from $349 to $399.

Toshiba America, Inc., 9740 Irvine Blvd., Irvine, Calif. 92718, or call (800) 457-7777.

New Alcatel software increases System 3100 PBX port limit

Alcatel PABX Systems Corp. recently released enhanced software that enables its System 3100 private branch exchange to support as many as 768 ports, compared with the previous maximum of 576 ports.

Called the **D6.1** software upgrade, the enhanced software also enables the System 3100 to support as many as four T-1 carrier links. With D6.1 software, the System 3100 can be expanded to eight card racks. Each card rack is capable of supporting 12 eight-port station interface cards.

The D6.1 upgrade will cost users approximately $325 to $425 per line, depending on the system's configuration, according to an Alcatel spokesman. The upgraded System 3100 will be available later this month.

Alcatel PABX Systems Corp., 815 Slaters Lane, Alexandria, Va. 22314, or call (703) 684-3400.

Software offers interoperability between NetWare and LAN Mgr.

Interlan, Inc. recently announced a software product that provides interoperability between users of Novell, Inc.'s NetWare network operating system and Microsoft Corp.'s OS/2 LAN Manager.

Called **LMN Server,** the software resides on an OS/2 LAN Manager-based file server and lets NetWare workstation users employ standard NetWare commands to access the OS/2 LAN Manager server.

Because, LMN Server supports Microsoft's network driver interface specification, it will operate with all OEM versions of OS/2 LAN Manager, including 3Com Corp.'s 3+Open LAN Manager, according to an Interlan spokesman.

LMN Server also lets NetWare users transfer files to and from LAN Manager-based workstations and send electronic mail between workstations running on the different operating systems.

LMN Server is scheduled to be available for delivery during the first quarter of 1989 at a price of $895.

Interlan, Inc., 155 Swanson Road, Boxborough, Mass. 01719, or call (508) 263-9929. ◼

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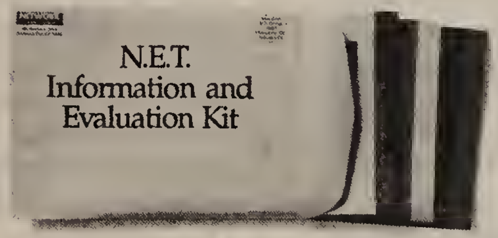

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OPINIONS

PLANNING

BY JOHN MCQUILLAN

The opportunity that most users continue to neglect

Everyone talks about network planning, but no one seems to do anything about it. As a consultant, I am frequently asked to help users with their network planning, either short- or long-term. But I am forced to recognize a depressingly familiar situation: when an organization does no planning in the true sense of the word and limits itself to responding to user requirements as they appear.

A surprising number of communications departments have either no formal mission statement or a statement that reads, "To provide the communications networks and connectivity solutions that users require to meet their business objectives." Such a mission can be interpreted in many ways, of course. Some organizations take a passive stance: Networks should follow the direction provided by operating management.

In practice, this means network staffs are busy dealing with the hands-on questions of network engineering almost all the time. Pressures abound: the need to drive communications costs down, the need to provide better connectivity from one set of equipment to another, the need for urgent troubleshooting and the need to expand facilities without disrupting service.

> Only 10% to 20% of the major organizations in the U.S. plan their networks proactively.
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For all too many organizations, dealing with problems on a weekly or monthly basis is termed "network planning." Of course, it is really nothing of the kind. Telecommunications departments in such companies are not permitted to develop their own plans. Instead, communications users develop their business plans, which involve some degree of communications support. This is assumed to come at minimum cost and maximum reliability.

This reactive approach probably dates back to the time when telecommunications was dominated by predivestiture voice telephony. User requirements — the number of telephones and desired grade of service — were more straightforward then. The infrastructure was often provided by Ma Bell without any need for in-depth planning. Even today, Centrex services are popular in part simply because they lift this burden off the customer.

But times have changed. Data commands a share of management attention equal to voice. There is a growing reliance on customer premises-based solutions. For all these reasons, plus the sharply increasing strategic relevance of networks to many businesses, true net planning is now vital.

In the surveys and consulting work that I have done in the last year, I have concluded that perhaps 10% to 20% of the major organizations in this country plan their networks proactively. These organizations invest in the network infrastructure. They develop a long-range view of their customer base and its needs and then install a set of network hardware and software solutions to meet those needs on an ongoing basis. Then, as each requirement emerges, it can be met in the context of an overall network architecture.

Many users say, "That kind of an approach would never work in our company." That may be true, but if your leading competitors adopt a truly proactive planning approach to telecommunications, they will gain such an edge in the marketplace that they will force your company to follow suit.

So, the real question, as always, comes down to this: Do you want to be a leader or a follower?

McQuillan is president of McQuillan Consulting in Cambridge, Mass. He assists users and vendors in planning future communications systems.

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EDITORIAL

Users must have answers now to price cap questions

In a little more than four months, if the Federal Communications Commission has its way, the time-tested rate-of-return method of regulating common carriers will be scrapped in favor of a price cap plan.

Yet the FCC has done little to allay deeply felt concerns about price caps. Some fundamental questions still need answers, and it isn't clear when the agency plans to address them.

In fact, it isn't even clear that the FCC has the power to implement a price cap plan.

Recently, the U.S. House of Representatives Subcommittee on Telecommunications and Finance issued a legal analysis that said the FCC doesn't have the authority to impose price cap regulations.

The subcommittee's reasoning is simple. The Communications Act of 1934 requires the FCC to ensure that rates for telecommunications services are just and reasonable. The only way that can be done, the subcommittee says, is by basing prices on the cost of providing service — a key area in which price caps differ from rate-of-return regulation.

Under the rate-of-return system, carriers are allowed to recover the costs of providing service plus some predetermined level of profit. Under price caps, the FCC would set ceilings on service prices. A carrier could increase its profit by cutting the cost of providing a service. The service price could remain artificially high — at least in terms of the cost of providing the service — as long as it is within the rate ceiling.

In short, the FCC could not ensure that rates would be just and reasonable under a price cap plan, according to the subcommittee's analysis.

That analysis accurately points out that the FCC has long been a proponent of cost-based pricing. It cites a 1976 ruling in which the FCC states, ". . . costs of providing service are at the heart of the statutory requirement of the [Communications] Act for just, reasonable and nondiscriminatory pricing."

> As a way station between regulation and deregulation, price caps just don't cut it.
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After the subcommittee report was released, the FCC canceled a Dec. 2 meeting at which, it was rumored, price caps were to be discussed.

The FCC is now in an awkward position.

Critics, including users groups and consumer organizations, have long assailed components of the plan, such as the methods to be used to determine price levels and to measure improvements in productivity. Now, a key congressional subcommittee has even questioned the FCC's authority to impose such a plan.

Perhaps the agency would be wise to scrap the plan.

As illustrated by the concerns raised, it doesn't seem that price caps would be any less cumbersome or complex than rate-of-return regulation. There certainly isn't universal agreement that price caps would be an improvement over the current regulatory framework. As a way station between regulation and deregulation, price caps just don't cut it.

But the FCC, particularly Chairman Dennis Patrick, has invested a great deal of time and prestige in price caps. How would it look for the commission to abandon the price cap plan now?

If the FCC intends to implement price caps according to its schedule, it must resolve immediately the important issues raised by advocates, as well as opponents, of the plan. If the agency needs more time to map out the plan, it should postpone implementation rather than make quick decisions in order to meet its own timetable.

Price caps involve a fundamental restructuring of the regulatory framework, and vendors and users need answers — specific answers — soon.

OPINIONS

THE BUSINESS WARS

BY BRUCE HOARD

Clash of the titans — one possible scenario

Imagine it. IBM and AT&T declare war on each other. Imagine the two behemoths snorting and pawing the ground, aching and straining to get at each other. Imagine the head-on collision, the marketing wars, the nasty comments in the press. Imagine two all-powerful companies that won't back down locked in a death struggle.

A lot of people have imagined just that — in print, in public and in private. It's a flight of fancy that will probably never be realized. But competition between Big Blue and the erstwhile Ma Bell is becoming a reality, and some serious turf is at stake.

Take, for instance, the federal government market. Both of the big boys scored heavily there recently. AT&T hit a $929.1 million jackpot when it beat out IBM and several other vendors to win a massive five-year Air Force contract. The deal calls for AT&T to deliver some 20,000 of its heretofore troubled 3B minicomputers. Throw in printers, software and maintenance, and the total tab is a cool $1 billion.

And that's just the beginning. According to AT&T, options in the contract could extend it another three years, bringing the total to $4.5 billion if the Defense Department and civilian agencies acquire everything they would like to.

> Competition between Big Blue and the erstwhile Ma Bell is becoming a reality, and some serious turf is at stake.
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On the same day the Air Force contract was announced, an administrative judge upheld the Federal Aviation Administration's (FAA) award last July of a $3.5 billion contract to IBM. The contract calls for IBM to overhaul most of the nation's air traffic control equipment. An interesting sidelight: Sore loser General Motors Corp. accused IBM of tricking GM's Hughes Aircraft Co. subsidiary into submitting a higher-than-necessary bid to the FAA.

Competition between IBM and AT&T in the government sector is nothing new. In 1985, when it was still reeling from the effects of divestiture, AT&T scored a coup over IBM by winning a three-year, $946 million contract from the National Security Agency. However, that was the last major government computer contract it won until the Air Force deal.

More recently, IBM inked a $176 million deal with the Navy to contract for acoustic equipment for nuclear attack submarines. The beat goes on.

The Unix battlefield

AT&T could reap a bonanza of future business with Unix. In fact, Unix could be the spark that leads to a hotter war between IBM and AT&T, not to mention Apple Computer, Inc., which is touting its own Unix version, A/UX. A/UX, incidentally, does not comfortably coexist with the Macintosh, which certainly won't help it gain widespread acceptance among Apple users, let alone the rest of the computing universe.

Anyway, in the weeks following the introduction of the Open Software Foundation (OSF), Sun Microsystems, Inc., which together with AT&T is peddling what most people consider to be the true Unix, seemed on the verge of actually joining OSF. Even AT&T, the most unlikely of partners, entered into a brief alliance with the group.

It didn't last. Just when everybody seemed to be getting cozy, the whole thing fell apart among claims and counterclaims. Now, the situation changes from day to day like a soap opera plot. The fact that both users and vendors are rapidly tiring of the situation is about the only certain thing that can be said of it.

The petty skirmishes

AT&T turned up the heat on IBM and several other major vendors recently when it announced its belated entry into the lucrative, if increasingly crowded, systems integration market. AT&T's fledgling Systems Integration Division will be competing for a piece of the pie that International Technology Group predicts will grow from $397 million in 1987 to $4.49 billion in 1992. International Technology Group is a research firm headquartered in Los Altos, Calif.

With that much money at stake, there's bound to be some serious chafing between the contestants, especially when they all go after the hot, emerging electronic data interchange accounts, which AT&T has said it will pursue.

Network management will be another battleground. As things stand now, IBM's NetView and NetView PC hold a decided advantage over AT&T's Universal Network Management Architecture (UNMA).

> AT&T turned up the heat on IBM recently when it announced its belated entry into the lucrative systems integration market.
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For starters, NetView PC is far more accommodating toward competing computers than UNMA.

Secondly, NetView is a logical network management system, meaning it identifies the applications that reside on each host, the access methods they support and the paths they utilize.

By comparison, UNMA is a physical network management system. It is limited to identifying and correcting physical network problems. It is of no use when the problem is application-specific — in the software. This physical approach to network management can be considered a sublevel below the logical model.

NetView, like most IBM products, has the status of a de facto standard. UNMA aspires to follow the Open Systems Interconnection network management model, which is admirable. The only problem is there's no finished OSI net management model to accommodate. On top of that, IBM can also say it will support a finalized OSI model — a point in its favor.

The fight is young, but there is menace in the air and thunder on the horizon. ◘

Hoard is a free-lance video producer based in Ashland, Mass.

TELETOONS

BY FRANK AND TROISE

Great Moments in Telecommunications
#104
March 9, 1922
The first carphone is field-tested.
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LETTERS

The call quality issue

As director of research for The Eastern Management Group (TEMG), I am interviewed from time to time by *Network World* concerning the viewpoint of the firm and my own observations on telecommunications and related issues. I look forward to continuing that relationship but must take exception with a quote credited to me in your Nov. 21 issue in the story "Call quality losing ground as user lure." In that story, I am quoted in the last sentence as follows: "I really don't think anyone gives a damn about quality anymore."

Perhaps something to that effect was said in the context of making a point during the interview, but that statement out of context misrepresents my views and those of TEMG regarding the significance of service quality to users. Quality has many facets, one of which is call (transmission) quality. I believe users care very much about quality and consider a wide range of attributes when assessing the quality of service they receive, such as call setup time, network congestion, billing accuracy and response to problems, to name only a few.

Transmission quality had been a weakness of all the competitive alternatives to AT&T's long-distance services.

(continued on page 44)

Network World *welcomes letters from its readers. Letters should be typed, double-spaced and sent to Editor,* Network World, *375 Cochituate Road, Box 9171, Framingham, Mass. 01701.*

Letters may be edited for space and clarity.

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The light at the end of the rainbow

CONTINUED FROM PAGE 1

fibers and lasers make for good advertising.

The benefits of fiber transmission are steadily advancing toward the local loop.

Fiber has real benefits, however, and there are several factors behind the strong inroads it's made into the physical plant of the public switched network. First, the modernization of the nation's telecommunications infrastructure could be more aptly termed digitization. Fiber provides a high-capacity medium that is well-suited to carrying digital signals over long distances.

Bob Reinhold is a manager with the Network Strategies Consulting Practice of Ernst & Whinney in Fairfax, Va. Rich Reinhold is an independent telecommunications consultant in Fairfax.

Second, the installation of fiber provides an easily upgradable system. Systems that had originally been installed to operate at 45M bit/sec are now capable of being upgraded to transmission rates of 405M bit/sec and greater with a mere change in the equipment at the end of each fiber span.

Third, fiber's compact size enables the carriers to expand capacity on existing routes where system expansion had not previously been possible. Fiber has been extensively used in metropolitan areas where congested conduits are commonplace.

Fiber in the public network

To understand the current role of fiber in the public network, let us first look at the components of the network. Figure 1 on page 31 shows the components that are encountered by a typical direct-dial, long-distance telephone call. A call passes through a minimum of four switching points and traverses at least five transmission spans. Switching occurs at both ends of the call at the central office switches of the local exchange carriers. En route from one local exchange carrier to another, the call will be switched at least once at each end of the interexchange carrier's network. The transmission media traversed in this process include the local loop, a long-distance carrier access line and the trunk facilities of the interexchange carrier.

In today's network, only a relatively small percentage of these components are digital. The interexchange carrier portion of the network is largely digital, but the percentage of digital facilities decreases as one approaches the subscriber location. This is still true, even though it has been clearly established that digital communications is superior to analog for carrying voice and data.

One of the main impediments to universal digitization of the public switched network and the accompanying pervasion of fiber has been simple economics. Consider the pyramid shown in Figure 2 on page 31. On the vertical axis, the relative information-carrying capacity of the public switched network components is shown. The horizontal axis describes the relative number of information-carrying devices in the network.

Considering that the number of devices is roughly equivalent to the investment a carrier has made in equipment, a strong economic case would have to be made for replacing equipment

(continued on page 30)

ILLUSTRATION ©1988 JUDY FILIPPO

(continued from page 28)

before it is depreciated. And in some cases this has happened. Let's consider how fiber is being used in the long-haul network and the local loop.

Interexchange carrier use

Fiber's entry into the public network made the most sense at the top level of the pyramid for several reasons. Initially, fiber products enabled longer distance communications at higher transmission speeds. From a capacity standpoint, fiber proved to be an economical transport medium. The high volumes of traffic carried at the interexchange carrier level justified the use of fiber on these routes. From an economic standpoint, there was less equipment to depreciate.

Also, the greater demands for capacity brought about by the information age required equipment upgrading. Fiber's capacity and capability for transmission over longer distances without repeaters made it an obvious choice from a technological and economic standpoint.

Fiber installations are working their way into the lower levels of the public switched network's hierarchy.

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As fiber technology matures, fiber installations are working their way down the pyramid and into the lower levels of the public switched network's hierarchy. Natural choices for the replacement of facilities with fiber are those areas served by older terrestrial analog facilities. But besides the benefits of digital transport, such as better noise performance, what benefits does the installation of fiber have?

First, fiber provides a very high bandwidth channel that takes up little physical space compared with other terrestrial facilities. Second, it is easier to maintain a fiber system than the broadband coaxial systems traditionally used for long-haul transport because there are fewer repeaters. Third, it is easier to upgrade a fiber system than one using copper or microwave transmission facilities because only the equipment at the end of each fiber span needs to be replaced and, again, there are fewer repeaters than in a span using metallic terrestrial facilities. While microwave towers and routes are reusable, frequency congestion is a problem in many cases. An upgrade in the capacity of a microwave system often involves adding new antenna equipment for communicating at different frequencies.

Unfortunately, these benefits can't be reaped everywhere. For example, in the western and southwestern parts of the U.S., the terrain and absence of adverse weather conditions (lack of heavy rains in desert areas, for example) make digital microwave an economical solution. It is doubtful that any carrier would install fiber in an area where a less expensive digital microwave system can provide equivalent service. Another place where fiber installations don't make sense is in extremely mountainous or rocky areas, such as northeastern Pennsylvania. The cost of installing fiber in these areas is prohibitive; it's easier to use digital microwave for transmission.

The motivation for change is not necessarily putting in a superior transmission medium but migration to a digital network.

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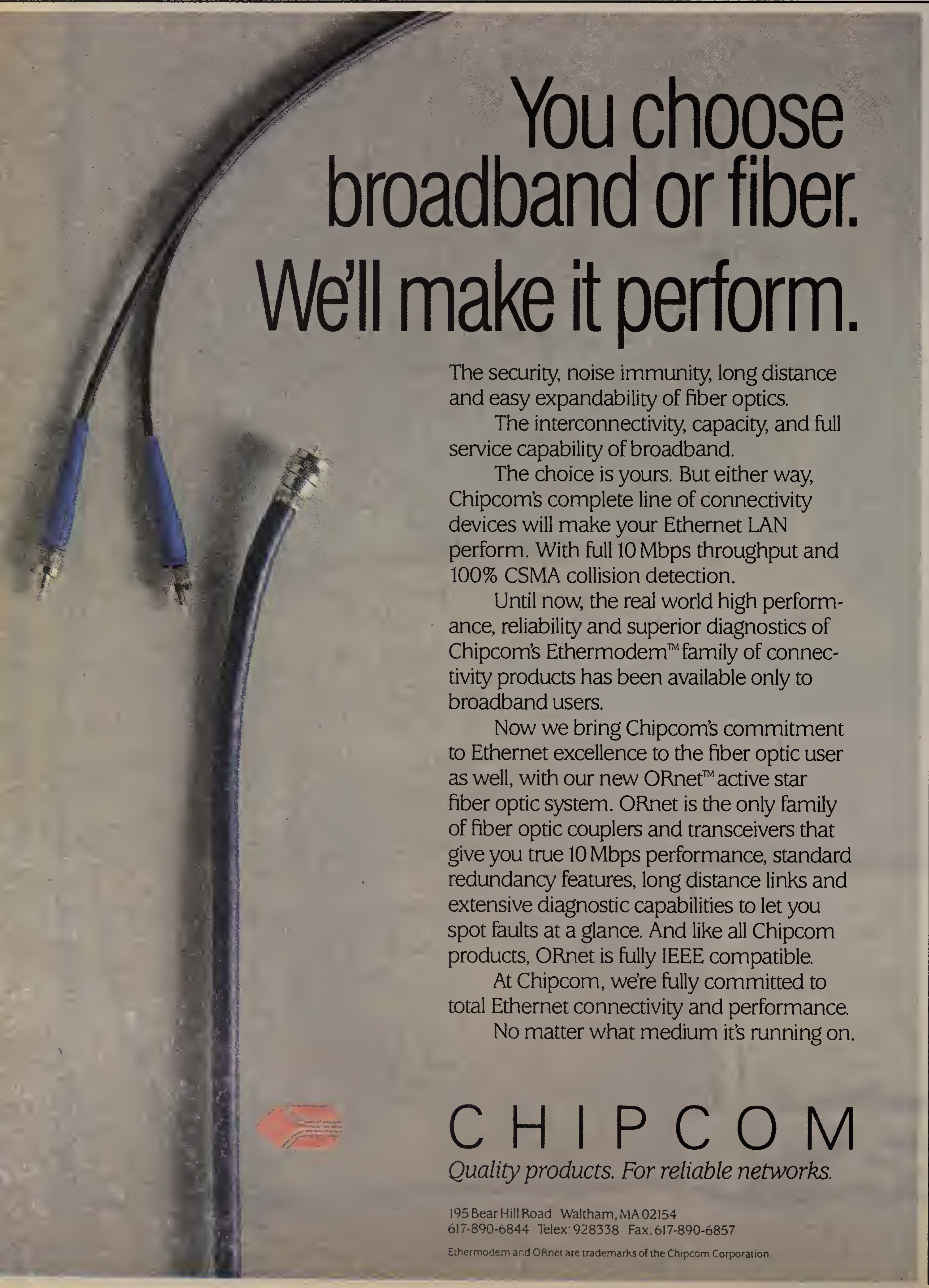
The motivation for change is not necessarily putting in a superior transmission medium but migration to a digital network. And when moving to a digital network, the carriers have a choice. In many cases where terrestrial circuits had not previously been cost-effective, digital microwave continues to offer the most effective solution. But for the majority of metallic terrestrial trunk lines in place, replacement with fiber optics has been an easy sell.

This seems to be the point of view of the major carriers as well. AT&T is in the process of replacing many of its terrestrial backbone routes with fiber. MCI Communications Corp. originally had a network composed entirely of microwave hops. Today, however, 13,000 of MCI's 42,000 network route miles are fiber, and another 2,000 route miles of fiber are planned for its network by year end.

MCI's principal use of the fiber, according to a company spokesman, is to build redundancy into the network. The majority of MCI's fiber is installed east of the Mississippi River and in high traffic routes to the West Coast.

US Sprint Communications Co.'s commitment to fiber technology is evidenced by its well-publicized "all-fiber" network consisting of 23,000 route miles of fiber, now completely installed.

Recently, several other players have entered the long-haul services market by



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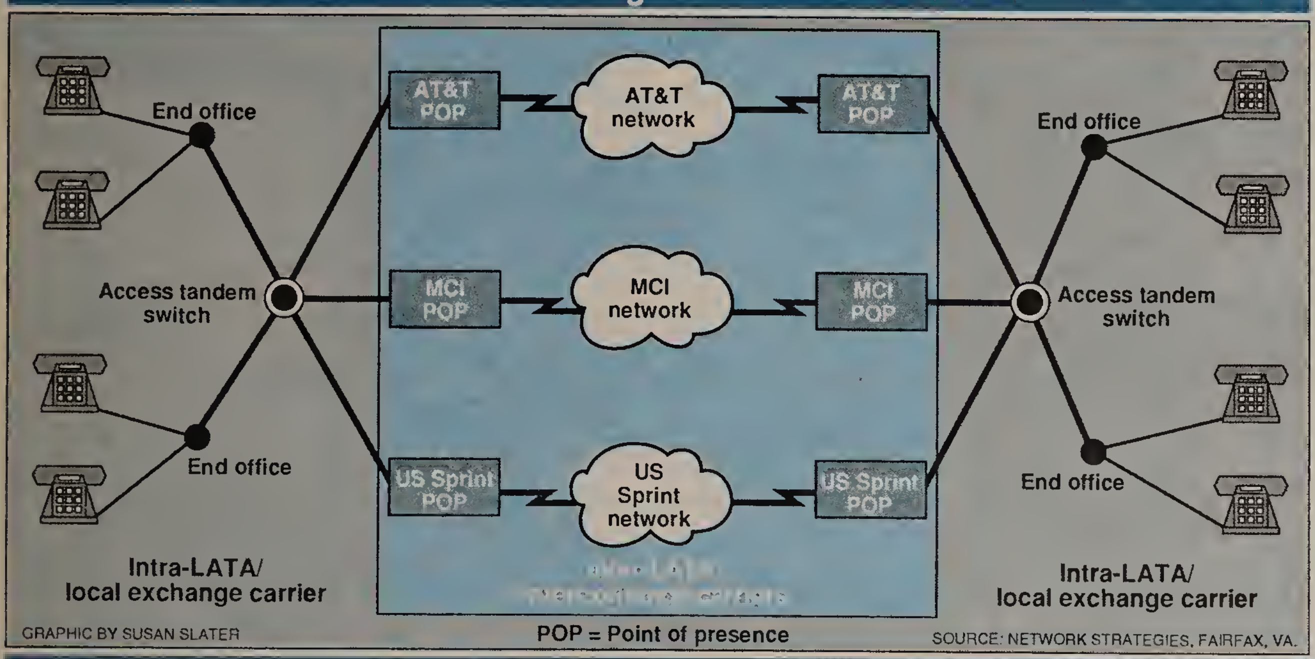
taking advantage of fiber optics. These new arrivals typically don't provide switched services but instead provide private leased capacity to businesses. These new carriers are usually subsidiaries of companies that already own long, narrow rights-of-way, such as those required for railroads, gas pipelines and power lines. Such rights-of-way are typically hundreds of miles long but only tens of yards wide. They also typically connect major cities. These two characteristics make such routes ideal for the installation of transmission facilities.

Public switched network

Figure 1



POP = Point of presence

GRAPHIC BY SUSAN SLATER

SOURCE: NETWORK STRATEGIES, FAIRFAX, VA.

Norlight, Williams Telecommunications Group, Inc. (WillTel) and Lightnet are examples of new fiber carriers offering long-haul service over their rights-of-way. In general, these companies don't have nationwide backbone networks, and they generally provide leased-line services along only the busiest (and therefore most profitable) traffic routes. A glut of inexpensive capacity along the heavily trafficked routes has pinched the long-haul service providers.

Since the newer carriers do not have to subsidize low-volume routes with revenues from their high-volume routes, they can drive the price of service between major cities below the prices offered by the major carriers. This cream-skimming by the newer carriers is fueling the trend toward cost-based pricing of long-haul services. Major carriers are charging less for their high-volume routes to compete with the newer carriers. Revenue from the high-volume routes can no longer subsidize the low-volume routes and, therefore, low-volume routes are becoming more expensive to obtain.

One advantage the major carriers retained for some time was their unique ability to provide coast-to-coast leased service. Recently, however, some of the newer carriers have been looking into ways of connecting their networks in order to provide coast-to-coast service.

An example of this is the interconnection agreement reached a year ago by WillTel and Lightnet. The two independent carriers interconnected their networks in Chicago and New Orleans to provide their customers with nationwide private-line service over their combined 10,000-mile fiber network.

Superior performance?

Many network providers have advertised that the presence of fiber will provide users with a network of superior quality. In general, users judge signal quality on the basis of its noise performance, echo cancellation and lack of noticeable delay.

It is the use of a digital transmission medium, and not necessarily the use of fiber, that gives superior noise performance and lack of signal echo. Lack of noticeable delay is inherent in signals that are sent over terrestrial circuits. Satellite facilities are typically to blame when a user experiences unacceptable signal delays on a long-distance call. Because fiber is immune to electromagnetic interference and isn't subject to rain fade, it can provide a cleaner transmission medium than most other terrestrial facilities can.

> Fiber can provide a cleaner medium than most other terrestrial facilities can.

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Thus, it can be argued that the use of fiber in the long-haul portion of the network removes a potential noise source and that the network is therefore superior.

However, recalling the earlier description of the public switched network, a typical long-distance call will pass through at least four switches and traverse at least five different transmission links. While it may be the case that all four switches are digital switches (and this would not be uncommon in a call between two major metropolitan areas), it is highly unlikely in today's network that the local loops on each end will be digital. And analog links are where most of the noise gets in.

The resulting network of digital interexchange links and analog local loops is comparable to a chain in which the last link or two on each side can support only 20 lbs. while the middle five or 10 links can support 100 lbs. It can be argued that the chain is a better one than one with all 20-lb. test links, but when it comes down to it, both chains support only 20 lbs. Similarly, no matter how strong US Sprint, MCI and AT&T make their long-haul networks, the signal quality on a switched call will still be largely determined by the quality of the equipment in the offices of the local carrier on each end.

How do you get the whole chain to hold 100 lbs.? A digital local loop.

Fiber in the local loop

The use of fiber in the local loop has been the subject of many articles in the trade press. With the vast potential of services that could be offered to the subscriber community given the bandwidth of an end-to-end fiber run, local-loop fiber trial reports are even beginning to rival reports of Integrated Services Digital Network trials for space in the press.

As always, one of the driving issues is economics. At first, the standard thinking was that fiber is good only for the long haul. Reliable transmitters and receivers were expensive, and even these weren't that reliable. Fiber to the home? That was still a long way off.

Well, fiber technology has come a long way in a short time. Rapid advances in semiconductor technology have made inexpensive and reliable laser diodes a reality. The cost of installing a fiber link in the local loop is approaching the cost of installing a copper pair. The fiber itself is already less expensive than copper.

Many industry analysts believe that if current trends hold true, fiber will prove to be less expensive than copper for plain old telephone service by late 1991 or 1992. There are many who believe the local carriers cannot afford to wait even that long.

The apparent successes in ISDN trials have encouraged service providers to believe that there is a real market for high-capacity connectivity to the home. In fact, this market calls for even higher capacity than the 2B+D ISDN Basic Rate Interface.

The seers are calling for broadband ISDN and provision of switched video services by the local exchange carriers. But to provide all of this digitally is expensive today.

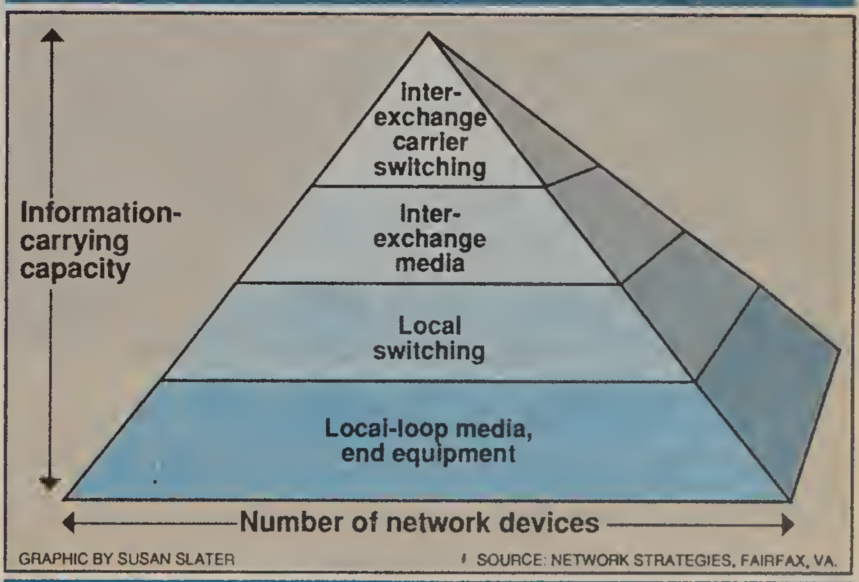
Many believe that broadband service to the home is a revenue opportunity that the carriers cannot afford to pass up. The fear is that if the opportunity to invest in the network is not seized now, the market will be taken over by other interests, particularly cable television companies.

There are primarily two options for providing fiber in the local loop. The first entails providing all-digital service, including video, over a single fiber. Although this option may eventually possess a longer term cost advantage, many proponents of using fiber in the local loop are supporting a two-fiber approach in which one fiber is used for providing plain old telephone service and the other is used for carrying video.

While many industry representatives make it clear that all-digital broadband ISDN is truly their goal, trials of fiber in the local loop are incorporating both the one-fiber and two-fiber approaches. Bell Atlantic Corp. provides such an example. The company's Princeton Gate project is based on the provision of telephone service over one single-mode fiber to each home. When broadband ISDN becomes technologically and economically feasible, the system can be upgraded through replacing end equipment.

The fiber-optic pyramid

Figure 2


Inter-exchange carrier switching
Inter-exchange media
Local switching
Local-loop media, end equipment
Information-carrying capacity
Number of network devices

GRAPHIC BY SUSAN SLATER

SOURCE: NETWORK STRATEGIES, FAIRFAX, VA.

In a second fiber-to-the-home trial in Perryopolis, Pa., Bell Atlantic is providing video services through an adjunct analog transmission using a fiber system provided by Alcatel N.A., Inc.

Nynex Corp., BellSouth Corp. and Ameritech are conducting trials with a new fiber network product that may speed up the introduction of fiber to the local loop. The cost of the bus-star, fiber-copper hybrid, recently introduced by Raynet, Inc., is expected to be equivalent to the cost of installing an all-copper distribution system. Thus, the Raynet system may shorten the time frame for the justification of fiber in the local loop to before 1992.

Activity of the local carriers to distribute fiber in the loop is further encouraged in metropolitan areas by the arrival of local providers of leased fiber service. Recently, two companies announced their intentions to build fiber-optic networks in and around the Boston area to provide all-digital fiber services in direct competition with New England Telephone and Telegraph Co.

One of the companies, Teleport Boston Corp., announced plans to build a 100-mile fiber triangle between Boston, Cambridge, Mass., and Burlington, Mass. — a network topology that will encompass much of the high technology industry located on Route 128 — "America's Technology Highway."

The second firm that intends to compete for the Boston leased facilities market is Teleport Communications-Boston, a subsidiary of Merrill Lynch & Co., Inc. and Fidelity Investments. Teleport Communications-Boston's network will consist of 15 to 20 miles of fiber in the downtown Boston area. Both companies plan to have their networks operational sometime in 1989. Similar networks are already in place in New York, Chicago and Washington, D.C.

Clearly, fiber-optic technology is not a panacea. But fiber is affording some great capabilities and opportunities in the public network and, in many cases, is a motivating factor for provision of new services.

Fiber is slowly replacing copper as the medium of choice in the network, but a complete replacement is still a long way off. Fiber should be pervasive in the local loops of major metropolitan areas by the late 1990s or early 2000s, but it will take much longer to enter local loops nationwide. ◼

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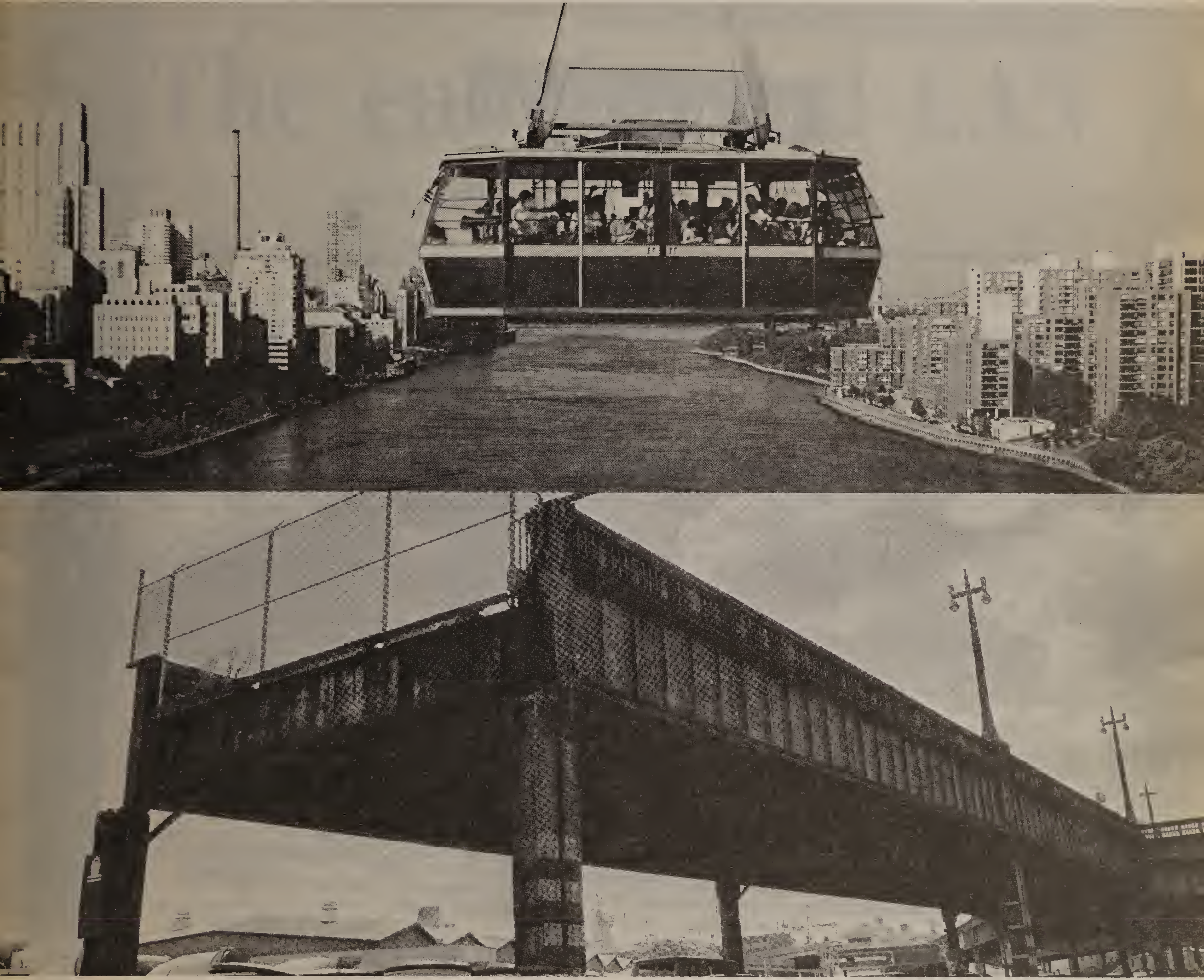

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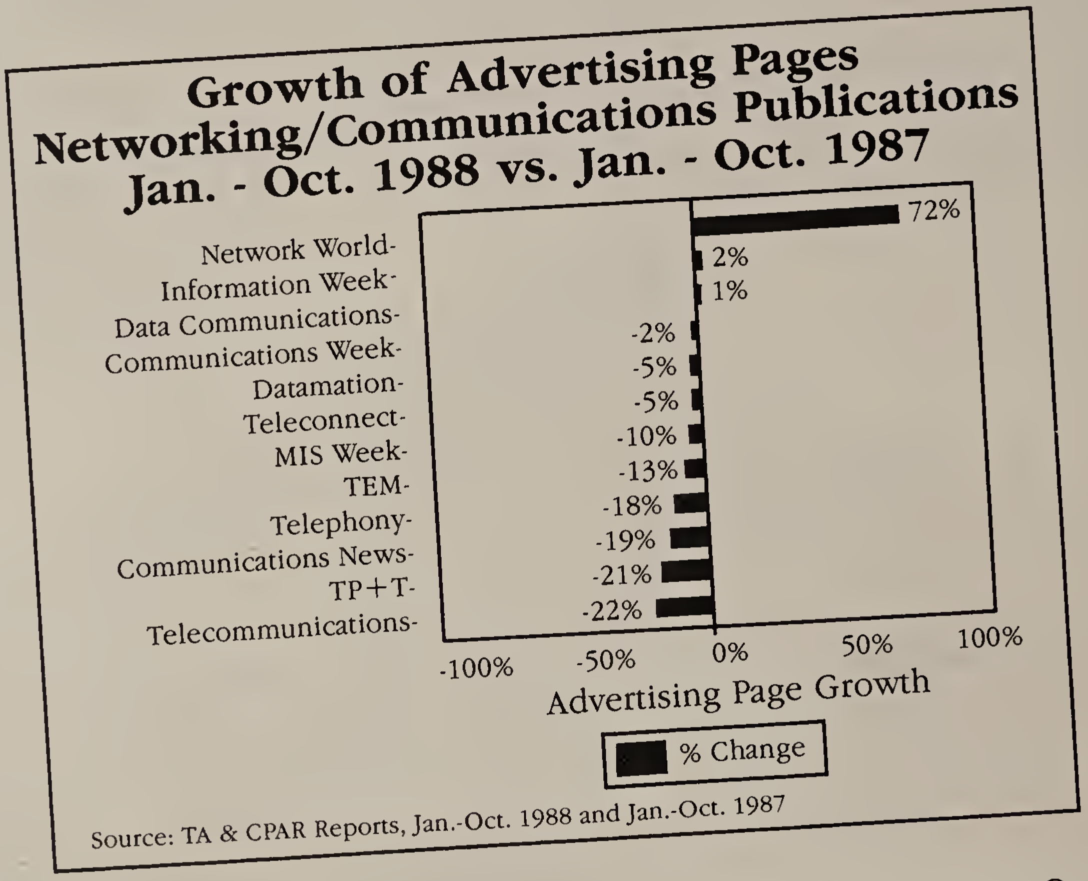

Growth of Advertising Pages Networking/Communications Publications Jan. - Oct. 1988 vs. Jan. - Oct. 1987

Source: TA & CPAR Reports, Jan.-Oct. 1988 and Jan.-Oct. 1987

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Management Update

Fiber-optic systems

The enlightened LAN

By MICHAEL HOWARD

The Fiber Distributed Data Interface (FDDI) local-area network market, almost nonexistent in 1988, will become a high-growth market starting in 1989, according to recent industry forecasts. The market for FDDI network products is expected to grow from $6 million in 1988 to $48 million in 1991, an increase of 700%.

Much of the need for FDDI local networks stems from the growth of work-group local nets and the need to connect them with the total corporate network. In 1990, the impact of FDDI will begin to be felt in the work-group environment, especially when connecting engineering workstations together. Users will want to upgrade existing host-to-host local network sites to the higher performance of FDDI speeds. As the principal vendors of existing host-to-host products — such as Network Systems Corp. (NSC) and Digital Equipment Corp. — begin shipping FDDI-based products, this market segment will grow rapidly. It will likely account for about 17% of the FDDI market in 1991.

However, the local net-to-local net backbone net market segment will become the largest piece of the FDDI local net market in the next few years. The number of FDDI backbone networks is projected to grow more than 300% between 1988 and 1991. As distance and performance become the major networking issues facing midsize and large organizations, FDDI local network technology will become the most common backbone.

Market forces at work

There are two forces driving the growth of the FDDI local network market. One is the sheer quantity of devices being networked. In the past year, the number of nodes added to networks has increased dramatically; this will continue into the foreseeable future. Once mainframes and minicomputers were networked, it was inevitable that terminals and personal computers would all be attached to obtain access to the data on the hosts.

This explosion of devices on networks requires segmenting them into subnetworks connected by means of backbones. These subnetworks can be isolated from traffic not intended for them.

The other driving force behind the FDDI local net market is the increased power of hosts. More powerful mainframes and minicomputers, especially the new breed of superminicomputers and mainframes, are requiring higher performance networks to keep up with the speed of the host.

Even at the desktop, the increasing power of personal computers and engineering workstations is driving new applications, including graphics and the use of color.

These new applications require that much larger amounts of data be transported around the network than previous text-only applications, and more data requires more performance.

Present FDDI technology

In a recent study of the use of local nets in large organizations, Infonetics, Inc. found that 4% of the sites surveyed claimed to have installed FDDI networks. Sixteen percent of the sites reported that they will have FDDI networks in the next year.

There are two problems with these findings:

- FDDI does not yet exist as an official standard.
- The cost of FDDI connections must drop significantly before any widespread market expansion will occur.

Survey respondents are actually either using FDDI-like technology that meets the FDDI draft standard specifications or using another high-speed fiber-optic product. Some vendors are selling FDDI-like products with the promise to upgrade to the standard after it is finally approved.

The cost of FDDI connections will drop somewhat after new

(continued on page 44)

Howard specializes in internetworking as vice-president of Infonetics, Inc., a consulting firm in Santa Clara, Calif.

Lightning-fast delivery of large amounts of data on local nets is imminent as FDDI gathers momentum.

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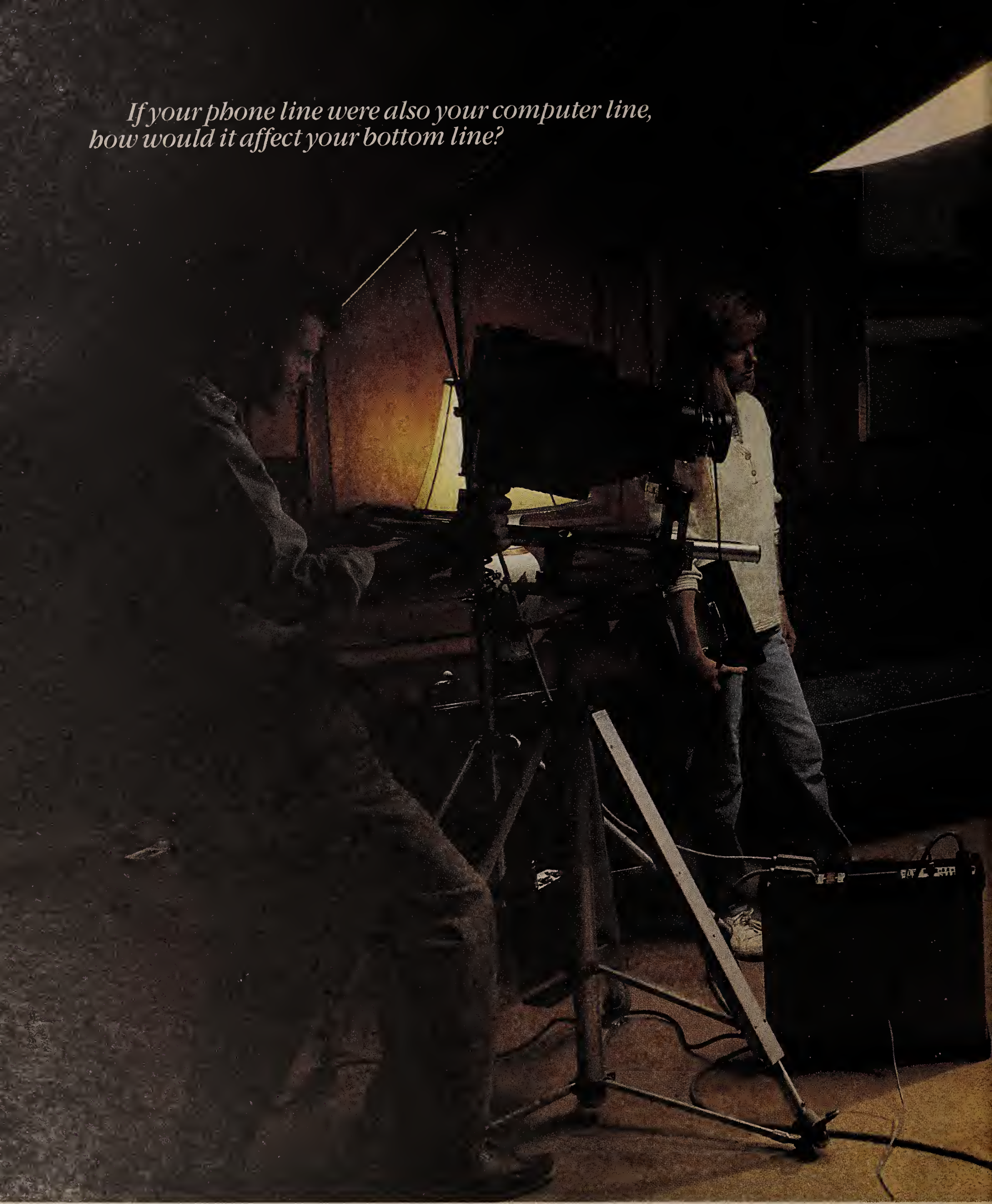
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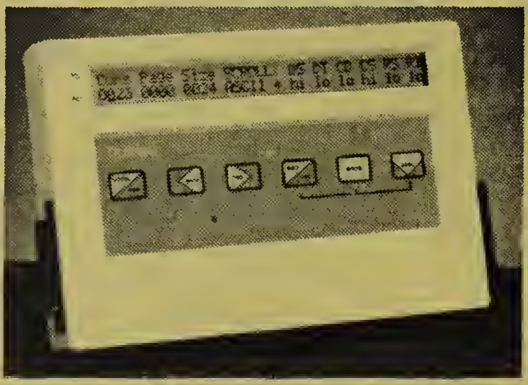

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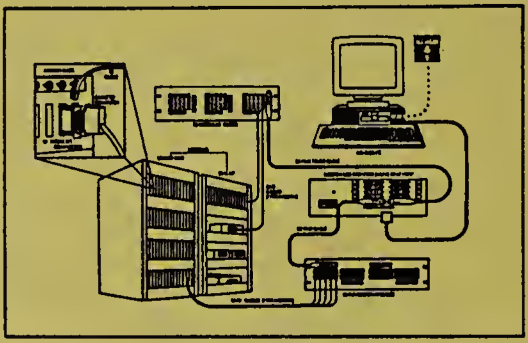

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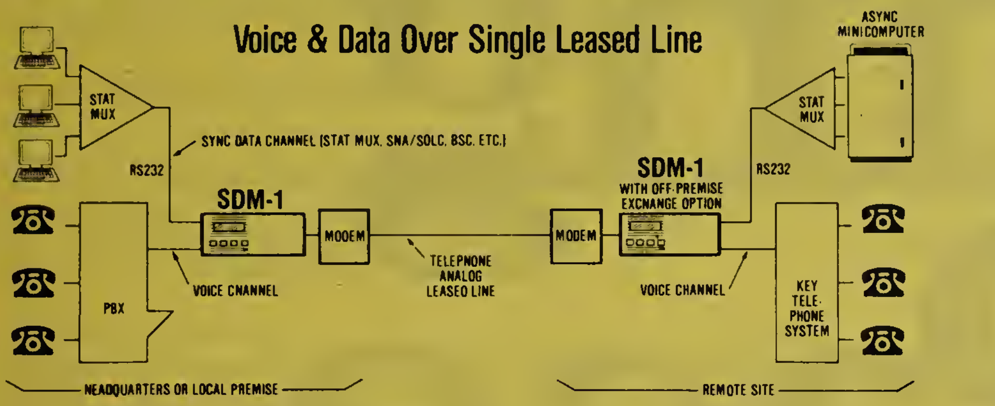
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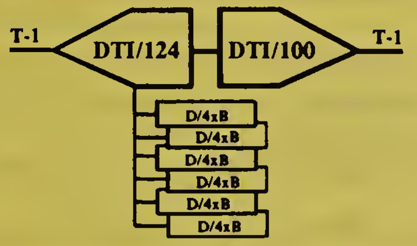

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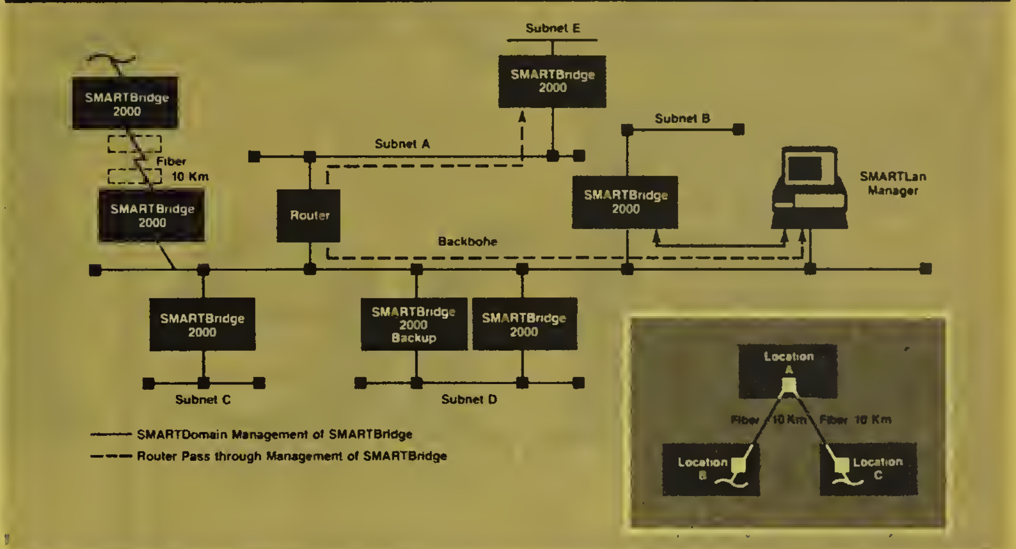

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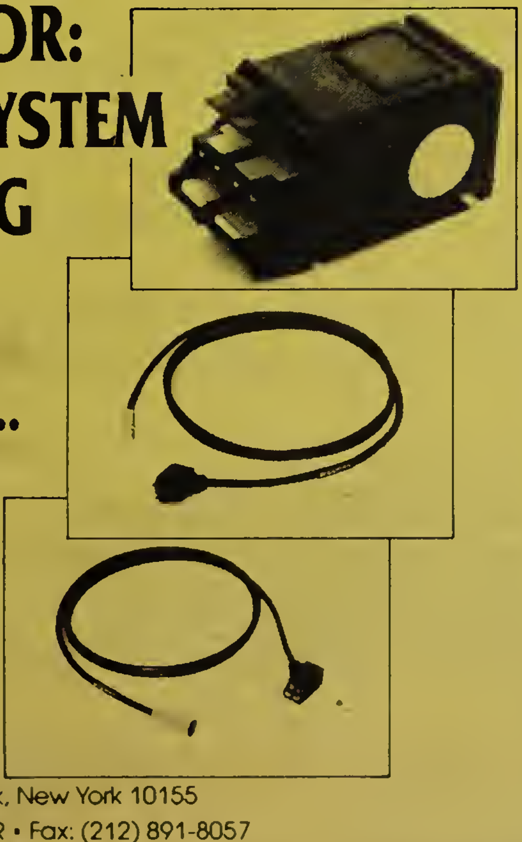

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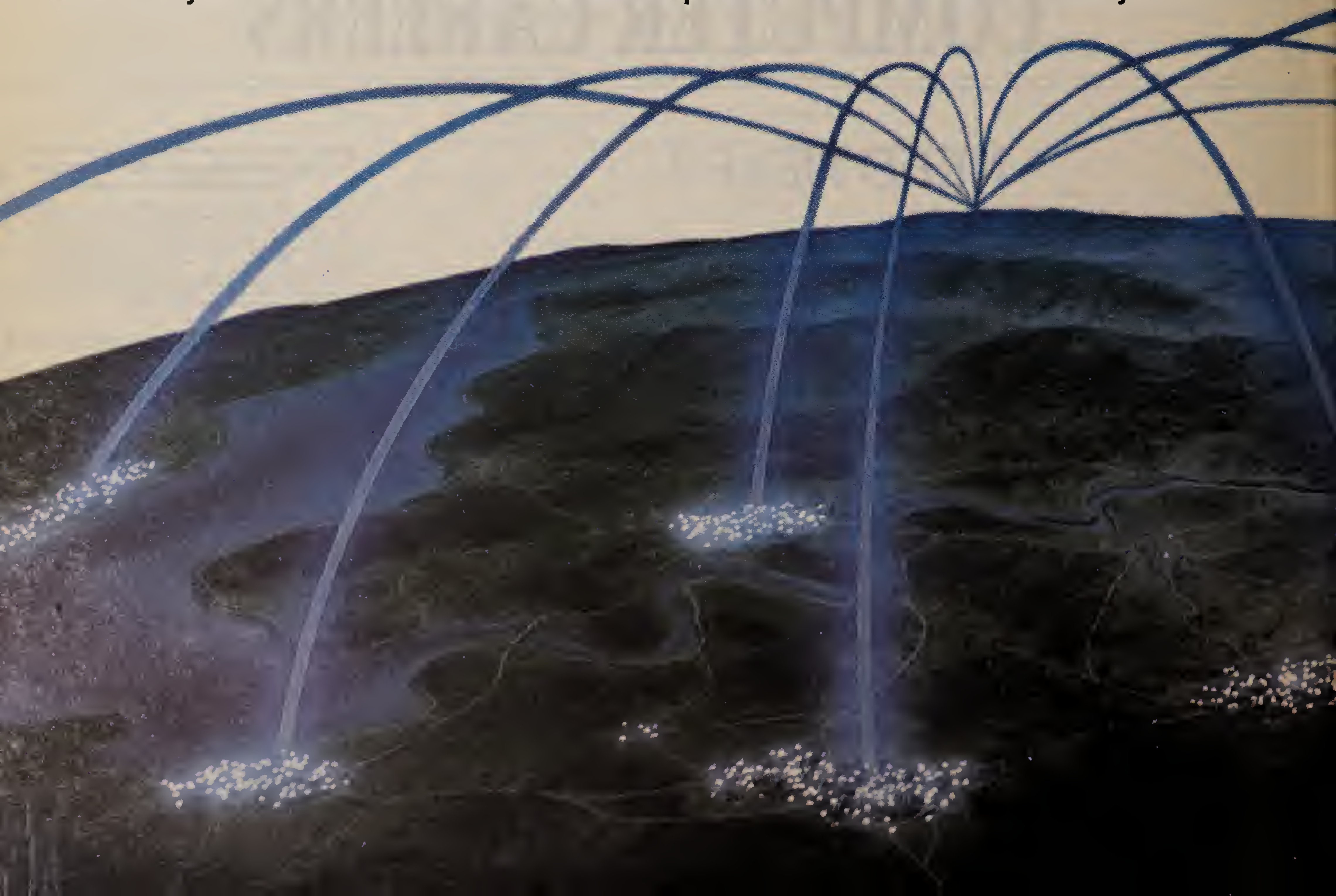

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The enlightened LAN

continued from page 35

very large-scale integration (VLSI) components are made available in 1989. A gradual decrease in cost will occur as demand increases the number of products manufactured. Further technology improvements will also contribute to decreasing FDDI costs.

FDDI was originally proposed to serve two major needs:

- High-speed host-to-host and host-to-peripheral communications.
- Backbone networking to connect lower speed local networks such as Ethernets.

To accomplish these goals, FDDI's principal feature is its 100M bit/sec data transmission rate. The FDDI specifications have been developed primarily by computer and communications vendors participating in the ANSI X3T9.5 Committee. Only the issue of FDDI network management, the final impediment before FDDI becomes an official ANSI standard, remains unresolved. In early to mid-1989, the official FDDI standard is expected to be approved, and many vendors will develop products to meet its specifications.

Due to the relatively small size of the FDDI local network market during the next few years, only a few vendors will emerge as dominant FDDI local net vendors.

▲▲▲

Due to the relatively small size of the FDDI local network market during the next few years, only a few vendors will emerge as dominant FDDI local net vendors. These vendors will manufacture products and sell them to the major networking vendors for marketing, distribution and support to the end user. Japanese companies will also play a role in this market, as they have been developing fiber-optic local network products for many years.

The currently popular internetworking protocols, Transmission Control Protocol/Internet Protocol and Open Systems Interconnection Layer 4, will be the initial transport-level protocols used with FDDI. The TCP and OSI Layer 4 transport protocols have too much overhead for 100M bit/sec throughput, so streamlined versions of these protocols may be used. But even the streamlined versions of TCP and OSI Layer 4 will be too constrictive for the 500M bit/sec to 1G bit/sec nets now being developed in advanced laboratories.

A new protocol called eXpress Transfer Protocol (XTP) is being designed by several vendors to maximize throughput of very high-speed local networks. Protocol Engines, Inc., a start-up firm based in Santa Barbara, Calif., is developing a VLSI chipset, called the Protocol Engine, that will support XTP. Eleven companies, including Unisys Corp., Apollo Computer, Inc. and Silicon Graphics, Inc., have banded together to promote XTP and to push for its acceptance as an ANSI standard.

Future trends

High-speed local network technology is being developed in research and development laboratories around the world. Speeds above the 1G bit/sec range are already in development for very high-speed host-to-host requirements in supercomputer environments.

The increased power of the desktop workstation is driving the growth of data-intensive, graphical and color applications, all of which will require more performance from the local net. Eventually, FDDI may even be used at the desktop, though cost considerations may delay this beyond the next year or so. For example, Manufacturing Automation Protocol connectivity to the desktop is desired, but the relatively high cost of such a connection — approximately $2,000 to $3,000 — is inhibiting its growth.

With the explosion of networking in large companies, the demand for internetworking is increasing. Protocols such as TCP/IP are being implemented at a fast pace. As more networks are installed, the need for connecting them with high-speed backbones is inevitable and already noticeable. FDDI will fill this need. Bridges, routers and gateways from Ethernets and token rings to FDDI backbones will become the standard mode of operation.

Media access control-level bridges that support popular protocols, such as TCP/IP, OSI and LU 6.2, will probably be the most popular products initially. The transport-level protocol used on the backbone in conjunction with the FDDI lower level protocol will probably be OSI.

Fibronics International, Inc. of Hyannis, Mass., is now shipping a product it says is close to the expected standard. Proteon, Inc., FiberCom, Inc., NSC and Artel Communications Corp. are developing FDDI products and now offer upgrades from current products. DEC and IBM will develop FDDI products in the next few years, but they have yet to announce any details. Workstation vendors such as Sun Microsystems, Inc. and Apollo will probably announce product plans within the next few months.

FDDI local nets will be the technology of choice in the early 1990s, and users will find a growing market of established FDDI vendors to choose from during the late 1990s and beyond.

CDROM disks may lower costs

continued from page 13

According to Bosomworth, the end cost of producing a CD-ROM disk is expected to average about $15 per disk.

Not all users will benefit from compact-disk distribution of information, Bosomworth said. In some cases, users in a given industry are locked into a single information source, and there is no pressure for the vendor to cut service prices.

But where there are several competing data base providers, users are likely to see the distribution of CDROM lead to price cuts.

The availability of relatively inexpensive CDROM distribution may lead to the availability of offerings from new data base vendors that will not have to incur the overhead and maintenance costs associated with providing network access, he added.

The study, "CDROM: Threat to On-Line Services: Opportunity for Second-Tier Publishers," is available from IRD, P.O. Box 1716, New Canaan, Conn. 06840, or call (203) 966-2525.

Letters

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Inferior interconnection to the local exchange carriers was responsible for a large part of the problem, and the availability of equal access in the major markets resolved this issue on most calls.

In addition, network transmission quality problems resulting from substandard microwave systems and the use of satellite transmission characterized the competitive carriers in the early 1980s. Both US Sprint Communications Co. and MCI Communications Corp. phased out satellite circuits and committed to fiber-optic transmission during the postdivestiture period.

The result of this transition, plus the availability of equal access, has been to essentially equalize transmission quality for the major long-distance carriers; it is no longer an issue for most users, and this is the context of the quotation.

US Sprint became the first carrier to have 100% digital network transmission through fiber-optic facilities, and the company has capitalized on this achievement through a massive advertising program. The result has been to raise the awareness of some users regarding digital transmission. AT&T is taking extraordinary steps to eliminate this difference, although it has never been clear how significant it really is to users in the total context of service quality.

In summary, I agree with the comments of Robert Self on the call quality issue. This issue appears to be fading in the minds of users because they cannot perceive a real difference in most cases.

As Self points out, there are more pressing issues that deserve their attention, and many of these are real service quality issues that differentiate the carriers.

Jerry Stern
Director of research
The Eastern
Management Group
Parsippany, N.J.

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Firms unveil applications

continued from page 2

View a slight edge over its competitors, AT&T's Unified Network Management Architecture (UNMA) and Digital Equipment Corp.'s Enterprise Management Architecture (EMA). Each of the three architectures is designed to work with emerging International Standards Organization (ISO) network management protocols.

However, HP is delivering applications that can be used today while both UNMA and EMA are, for the most part, still under development, analysts said.

"I think [OpenView] may be a little further down the line than UNMA right now," said Paul Lee, senior consultant at the Network Strategies Consulting Practice of Ernst & Whinney in Fairfax, Va. "But HP needs some more [third-party vendor] support to say they're better than any others."

OpenView software is designed to support a mix of applications, enabling users to control a network of multiple vendors' equipment from a single microcomputer. Supporting Microsoft Corp.'s Windows software, OpenView uses a set of graphical images to display a map of network components. It also displays the status of and performance statistics about each vendor's wares.

OpenView supports a set of commands to monitor and control equipment from multiple vendors. For example, OpenView's command language enables an operator to use a single command to extract data from equipment made by different vendors. Most vendors use unique commands to perform the same extraction function.

HP is urging developers to transmit proprietary network management data to OpenView via the ISO's Configuration Management Information Protocol (CMIP) and Common Management Information Services (CMIS) network management protocols. CMIP and CMIS, which are not yet finalized, will standardize network management data formats and command languages. HP is a member of the Open Systems Interconnection Network Management Forum, which is trying to speed the development of CMIS and CMIP. ☐

U.S. endorses int'l net treaty

continued from page 7

dards with the State Department. "This could make life difficult for multinationals trying to run international networks."

Clare said that in the final version of the treaty, the objectionable regulations were watered down or removed. The treaty leaves individual countries free to regulate international and national communications in whatever manner they see fit.

"We never wanted this treaty to address several of the areas it did [at first]," Clare said. "To the extent that we avoided these, I think it is a fair compromise."

The agreement is set to go into effect in the mid-1990s and remain in place into the next century or whenever the ITU decides a new treaty is needed.

The treaty must be ratified by the U.S. Senate, which, according to Clare, "is in no hurry to examine this thing." ☐

AT&T, US Sprint win fed net deal

continued from page 1

draw up a joint transition plan that will take federal users from the current FTS network to the new FTS 2000 networks.

Both US Sprint and AT&T anticipate providing services to high-priority agencies specified by the GSA beginning in September 1989.

Currently, there is no requirement for the AT&T- and US Sprint-managed networks to interoperate, according to David Gergacz, chief operating officer for network systems at US Sprint.

The scope of FTS 2000

The FTS 2000 network will support:

- 1.3 million end users in 1,300 sites throughout the U.S., Puerto Rico, Guam and the Virgin Islands.
- Approximately 255 million voice calls annually.
- Approximately 45 million data calls annually.
- Integrated voice, data and video services, including private-line services, 56K and 64K bit/sec switched data services, packet switching, and compressed and wideband video services.

FTS 2000 will be phased in over three years. Its first users will be on the network in 1989.

FTS = Federal Telecommunications System

GRAPHIC BY SUSAN SLATER

SOURCE: THE GSA, WASHINGTON, D.C.

Users within one FTS 2000 network will be able to dial other sites in the network using a seven-digit number. But users calling between networks will have to dial a 10-digit number, he said.

Mixed news for AT&T

Although both AT&T and US Sprint said they were pleased to win the contracts, some in the industry said they believe that AT&T was only a partial winner.

Alan Pearce, president of Information Age Economics, a telecommunications research firm in Washington, D.C., said AT&T was probably disappointed with the outcome because the contract was split into two parts. He said AT&T expected to win the entire contract. "But it's better to get some money from [FTS 2000] as opposed to nothing," he said. "The only ecstasy in town is with US Sprint."

Richard Lombardi, vice-president of AT&T Federal Systems, said the carrier gets about 50% of the revenue from the current federal telecommunications network and that, with a 60% share of FTS 2000, it expects its revenue to increase.

But some analysts speculated that by winning only a 60% portion of FTS 2000, AT&T's federal government revenue may actually decrease.

Steve Kropper, senior telecommunications analyst with International Data Corp., a Framingham, Mass., market research firm, said AT&T's current share of the government market is 70% to 80%.

Pearce said that even if AT&T retained approximately the same market share, its revenue from the government market is likely to decrease because it had to match the lower prices of competitors.

According to information provided by the GSA, the government paid about 30 cents per minute for intercity services in 1987. It is likely that AT&T's bid for FTS 2000 was closer to the volume discount prices offered to large customers such as Holiday Corp. and Marriott Corp. Service under those packages costs between 15 and 18 cents per minute.

US Sprint wins big

US Sprint is being described as the big winner of FTS 2000 by company officials and analysts. "The government's careful scrutiny of the bidders and their ability to perform gives a stamp of approval to US Sprint," said William Esrey, president of US Sprint. He attributed his company's ability to handle such a large project to its fiber-optic network.

"Today's announcement shows that [building an all-fiber network] was a very sane, very heroic and very strategic business decision," Esrey said.

Kropper said he was surprised that US Sprint won the contract for several reasons. One was the turmoil the US Sprint bidding team faced after its bidding partner, Electronic Data Systems Corp., withdrew last year. Another reason is that US Sprint has had problems with its billing systems, and accurate billing is an important requirement of the FTS 2000 contract.

However, Pearce, who also described US Sprint as a surprise winner, said the company could use the regional Bell holding companies to handle billing.

Challenge looms

One of the biggest questions now hanging over FTS 2000 is whether the MCI/Martin Marietta team will challenge the award.

A protest must be filed with the GSA Board of Contract Appeals within 10 working days after the award. It could be based on a number of areas, including improper evaluation procedures or a claim that the winning bidder is not capable of supporting the contract, according to an attorney with the GSA. When a protest is filed, the contract is suspended until the board issues a decision.

AT&T must offer FTS 2000 as a tariffed service and several analysts and attorneys in the industry have speculated that it will be filed under Tariff 12 ("FTS 2000 contract award may not calm controversy," *NW*, Dec. 5). The legality of offering customized networks under Tariff 12 has been challenged by a number of parties and the tariff is now under investigation. ☐

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Car makers push EDI to new levels

continued from page 1

believe expanding the use of EDI will help them in their efforts to implement just-in-time manufacturing systems.

By lowering component and manufacturing costs, the car makers hope to improve their competitiveness against powerful overseas companies.

"The efficiency of the entire auto industry is at stake," said Roger Cadaret, a senior administrator in production control at General Motors Corp. in Detroit. "EDI is something that all American car companies and suppliers can exploit to gain a competitive advantage."

Car makers already claim to be enjoying great savings from using EDI with their suppliers. With EDI, firms use networks to electronically exchange business documents, such as purchase orders and invoices, that otherwise would go through the mail. EDI cuts down the paperwork involved in buying goods and reduces reliance on error-prone manual data entry.

The Automotive Industry Action Group (AIAG), a Detroit-based industry consortium, estimated that auto firms using EDI with suppliers cut their manufacturing costs by $500 per car.

Several years ago, the Big Three automakers — Ford Motor Co., Chrysler Corp. and GM — mandated that their suppliers support EDI for most business transactions.

The car companies initially set up proprietary EDI networks. Now, under pressure from suppliers, the automakers are migrating to open EDI networks based on ANSI X.12 standards.

The automakers should finish this transition in two to five years, according to executives in the car companies and the AIAG.

A matter of survival

But suppliers have not embraced EDI to the extent that they should, according to many in the auto industry.

"I figure that 99% of the first-tier auto suppliers don't do EDI with their own suppliers," said Robert Grau, manager of customer supply systems with ITT Automotive, Inc. in Bloomfield Hills, Mich. "They've been so busy installing EDI with their customers [the automobile manufacturers] that they haven't had time to work something out with their own suppliers."

Pressure is building on these companies to change this, however. At a recent executive meeting of the AIAG, auto company representatives expressed concern about the limited use of EDI. Others said automakers are privately lobbying their suppliers to set up EDI systems with the companies from which they buy parts and materials.

The biggest pressure, however, may be economic. EDI has emerged as the linchpin supporting just-in-time manufacturing systems, which are central to American car company efforts to cut costs and boost sales.

Just in time

In just-in-time systems, firms save money by minimizing inventories. They rely on suppliers to deliver parts and materials as they are needed.

This puts tremendous pressure on suppliers to have equipment and materials on hand for last minute requests.

Such requests are typically too time-sensitive to be sent to distant suppliers through the mail, so firms handle them through EDI.

"EDI is critical for just-in-time deliveries," said GM's Cadaret. "In this country, you can't really have just-in-time without it."

Suppliers have been forced to beef up inventories to deal with the new manufacturing strategy. Many are searching for ways to decrease these inventories and are looking at EDI and just-in-time deliveries to help them do it.

"For us, it's a matter of survival," Grau said. "If we want to make a profit selling to car companies, we've got to do EDI and just-in-time with our suppliers."

Last year, ITT, which sells antilock brakes and windshield wipers to car manufacturers, instituted an EDI program for its suppliers.

About 20 of its 800 vendors are involved in the program. Grau said his company should have all of its suppliers on-line within the next two years.

Auto industry executives said they hope that the upshot of these efforts will be to make American car makers more competitive.

"The Japanese already have extensive just-in-time delivery systems," Cadaret said. "We need to extend EDI throughout the American auto industry if we want to compete with them."

MCI reduces rates 3.9%

continued from page 4

all Prism I usage and a 20% discount for all Prism Plus usage. CAS Plus is a pricing option that lets businesses with multiple locations group the long-distance bills of each location into one larger bill.

Also last week, MCI announced it has awarded a multimillion-dollar contract to ICL, Inc. for an electronic message handling system that complies with the CCITT's X.400 and X.500 standards.

According to MCI, the ICL system will support new services including electronic data interchange, messaging, message storage, directory services, the ability to send and receive telex messages and facsimile copies, and the ability to send both ASCII and binary files. The system will be linked with MCI Mail, giving MCI Mail users access to those services.

ICL is a subsidiary of STC PLC of the UK.

Calendar

Jan. 11-13, Tampa, Fla. — Telecommunications Management. Contact: *Business Communications Review,* 950 York Road, Hinsdale, Ill. 60521; (800) 227-1234.

Jan. 16-20, Denver — The Winter/Spring Omnicom Week. Contact: Omnicom, Inc., 115 Park St. S.E., Vienna, Va. 22180; (703) 281-1135.

Jan. 17-18, King of Prussia, Pa. — Winter Meeting of the Telecommunications Committee. Contact: Philadelphia Electric Co., 2301 Market St. (N2-1), Philadelphia, Pa. 19101; (215) 841-6363.

Jan. 18-21, Palm Springs, Calif. — National Association of Telecommunications Dealers 1989 Winter Conference. Contact: National Association of Telecommunications Dealers, 1255 23rd St. N.W., Washington, D.C. 20037; (202) 872-8420.

Jan. 19-20, Newark, Del. — Networking the IBM PC, XT, AT, PS/2 and Compatibles. Contact: Data-Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015; (201) 478-5400.

Jan. 20-22, San Francisco — MACWORLD Expo. Contact: MACWORLD Exposition, Mitch Hall Associates, P.O. Box 155, 1200 East St., Westwood, Mass. 02090; (617) 329-7466.

Jan. 22-25, Salt Lake City — 4th Telecommunications Conference. Contact: Conferences & Institutes, 2174 Annex Building, University of Utah, Salt Lake City, Utah 84112; (801) 581-5809.

Jan. 23-25, Phoenix — Document Processing and Optical Disk Systems Conference. Contact: CAP International, Inc., 1 Longwater Circle, Norwell, Mass. 02061; (617) 982-9500.

Jan. 30-Feb. 3, San Diego — USENIX Association Winter 1989 Technical Conference. Contact: USENIX Association, P.O. Box 385, Sunset Beach, Calif. 90742; (213) 592-1381.

Jan. 31-Feb. 2, San Francisco — Database Expo and Conference (DB/Expo '89). Contact: NDN Enterprises, 239 S. San Antonio Road, Los Altos, Calif. 94022; (415) 941-8440.

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AT&T fires new volleys in price war

continued from page 1

DDS is now available in more than 100 local access and transport areas. The service gives users dedicated, all-digital data transmission at speeds of 2,400 bit/sec, 4.8K bit/sec, 9.6K bit/sec and 56K bit/sec.

Under the tariff revision, AT&T deleted the $108 monthly charge for DDS Type 2 central office connections and reduced Type 1 DDS connection charges from $21.20 to $16.40.

The carrier also revamped the per-mile charges for the intercity segment of DDS circuits. AT&T said customers that use 2,400 bit/sec, 4.8K bit/sec and 9.6K bit/sec DDS links will save an average of 4.5% regardless of circuit length. Users with 56K bit/sec DDS lines will save about 4%.

AT&T also offered discount plans for DDS users. A one-year, fixed-price plan shields users from rate increases. The carrier will offer three- and five-year DDS pricing plans that provide discounts of 3% and 5%, respectively, compared to monthly pricing.

Additional discounts, based on volume, range from 1% for a one-year, $25,000-per-month minimum commitment, to 27% for a five-year, $250,000-per-month commitment, the carrier said.

"AT&T has turned over a new leaf," said Robert Self, president and founder of Market Dynamics, Inc., a New York-based communications research group. "They are trying to be more responsive to users."

The tariff said that special promotions would be instituted during different times of the year and in different parts of the country as needed. Customers will usually have up to 90 days to place orders for services with special promotions. AT&T said no promotion would exceed six months of waived or discounted charges.

"This is the competitive marketplace at work," said David Edison, executive vice-president for Westinghouse Electric Corp.'s communications systems division. "I'm very pleased and encouraged by both announcements."

Special pricing incentives

Edison said special pricing incentives play a key role in users' evaluations of services provided by different carriers. "Although we rarely make a deal based on a carrier waiving certain charges, waiving onetime service fees can knock two or three cents off the per-minute cost of a carrier's service."

With call quality roughly equal among AT&T, MCI and US Sprint, analysts say pricing has emerged as the top consideration when users evaluate services offered by long-haul carriers. ("Call quality losing ground as user lure," *NW,* Nov. 21).

Edison said AT&T had to revamp its DDS tariff or lose market share in the digital data services segment of the long-distance market. "AT&T realized time was running out on that tariff. DDS pricing is very high," he said.

"It's real good news to see DDS prices headed downward," said Dan Gonos, store system project manager for Domino's Pizza, Inc. in Ann Arbor, Mich. "We have already standardized on AT&T DDS [for data transmission]."

US Sprint's plans to offer a switched 56K bit/sec service were a factor in AT&T's decision to overhaul the DDS pricing structure, Edison said. "Customers are beginning to realize that a carrier with an all-digital net can offer a switched 56K bit/sec service at a very low price."

US Sprint has demonstrated a capability that enables users with digital access to its network to transmit data at 56K bit/sec over WATS and other standard dial-up connections.

Users who saw the demonstration told *Network World* that US Sprint's Switched 56 offering is roughly 75% less expensive than comparable AT&T services, adding that it would enable them to transmit data for eight to 12 cents a minute ("US Sprint shows off Switched 56," *NW,* Aug. 15).

AT&T said the DDS changes reflect advancements in service delivery and a response to user demand for term and volume discounts. "We don't want any [DDS users] to walk away from the service," an AT&T spokesman said.

AT&T weighs wider use of sales program

continued from page 2

Lawanda Kamara, one of Jarrett's New York sales representatives, showed an immediate interest in the information. "[She] recognized the value of the [data that McDermott] was providing," Jarrett said. "She was able to successfully win [customers] back when the lead was hot."

AT&T set up a two-phase sales trial at its long-distance service repair facility here and at its business offices in Boston and Syracuse, N.Y.

The carrier wanted to determine whether a technician or the local sales representative would do a better job of capitalizing on these leads.

In the first part of the project, leads generated by the repair center were passed to the local AT&T sales group. "In the second part of the trial, we asked the repair people to volunteer to do win-backs themselves," Jarrett said.

The results of the trial astounded AT&T. "[In cases where] the repair center people did the win-backs themselves on the spot — when the lead was the hottest — we had three times the success rate as when we referred leads to the local sales office," Jarrett said.

AT&T declined to name any of the users it won over.

"[Lead] generation is everyone's business," Jarrett said. "No matter who you are or where you work, there is always the possibility that you will have information that could be helpful to marketing. The only way anybody is going to know about it is if you share it with somebody. You never know what might come out of it."

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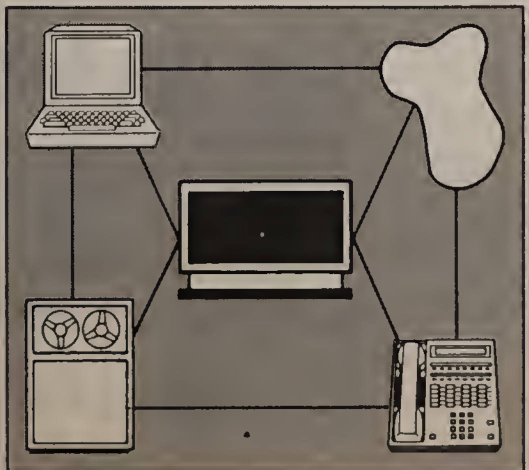

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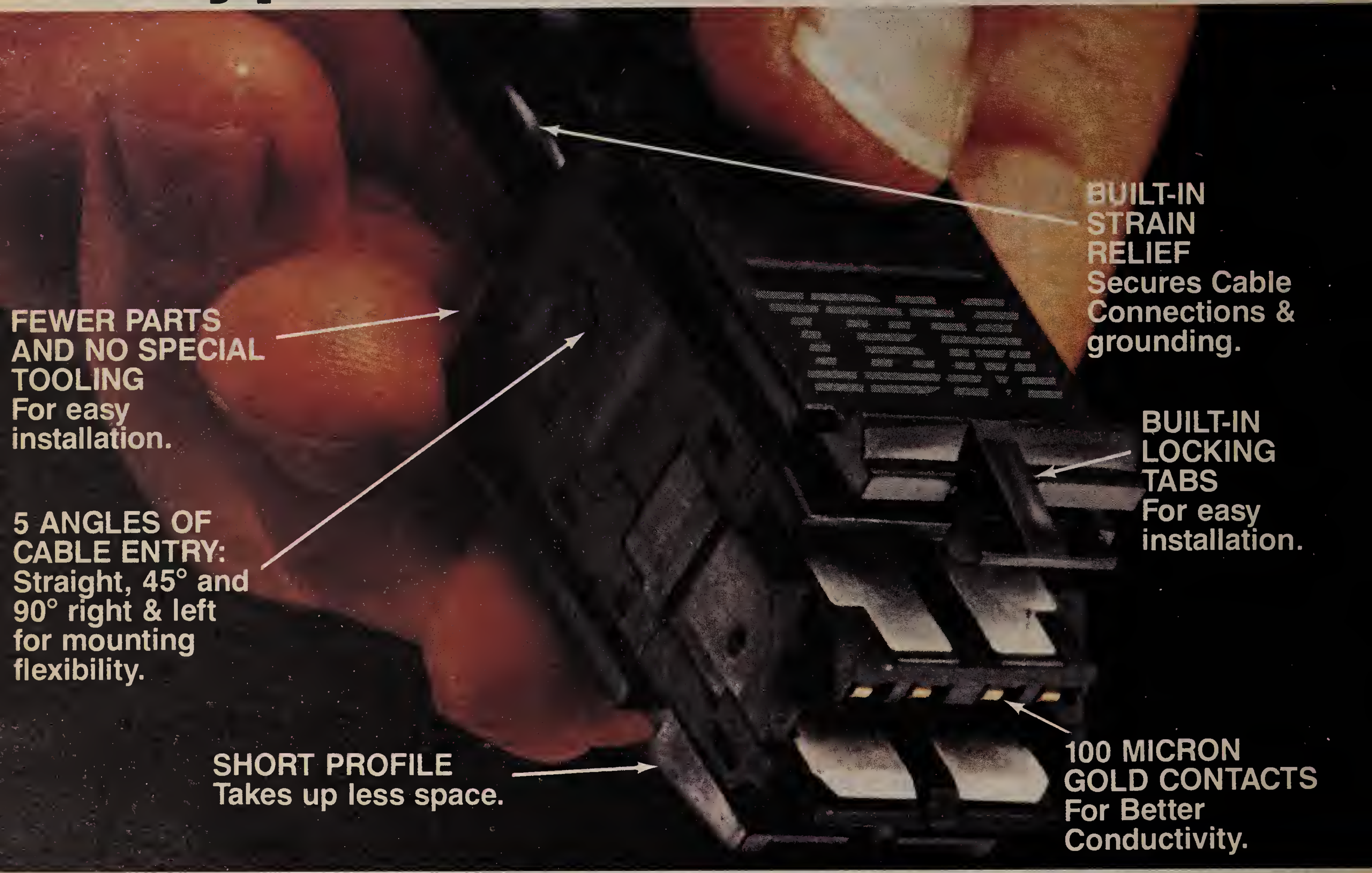
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